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A SUGGESTION

FOR

A BRITISH DECIMAL CURRENCY

AND

DECIMAL SYSTEM OF ACCOUNTS;

THE INTEGRAL UNIT BEING

ONE POUND IMPERIAL, VALUE FORTY SHILLINGS.

BY

C. A. MANNING,
FREMANTLE, WESTERN AUSTRALIA.

LONDON:
SMITH, ELDER & CO., 65 CORNHILL.
1867.

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A SUGGESTION

FOR

A BRITISH DECIMAL CURRENCY.

SUGGESTED

IMPERIAL METALLIC CURRENCY.

		IMPERIAL SYSTEM.						PRESENT STERLING SYSTEM.			
		POUNDS IMPERIAL.	DIMES.	CENTS.	MILS.	DECIMILS.		POUNDS STERLING.	SHILLINGS.	PENCE.	FRACTIONS OF PENCE.
GOLD COINS.		£	D.	C.	M.	D.M.		£	S.	D.	F.
Double Sovereign . .	= Pound Imperial	1	...	...	...	...	=	2	...	...	...
Sovereign (Pound Sterling)	= ½ „ Imperial	...	·5	...	...	...	=	1	...	...	...
Half Sovereign . . .	= ¼ „ Imperial	...	·2	5	...	...	=	...	10	...	...
SILVER COINS.											
Double Florin	= Dime	...	·1	...	...	...	=	...	4	...	...
Florin	= ½ do.	...	·0	5	...	...	=	...	2	...	...
Shilling	= ¼ do.	...	·0	2	5	...	=	...	1	...	...
Sixpence	= ⅛ do.	...	·0	1	2	$\underline{5}$ *b*	=	...	...	6	...
Long Fourpenny Piece	= Cent	...	·0	1	...	...	=	...	...	4	$\frac{100}{125}$
Short Threepenny Piece	= ½ do.	...	·0	0	5	...	=	...	...	2	$\frac{50}{125}$
INFERIOR METALLIC COINS.											
Long Penny Piece	= ¼ Cent	...	·0	0	2	$\underline{5}$ *b*	=	...	...	...	$\frac{25}{125}$
Short Halfpenny	= Mil	...	·0	0	1	...	=	...	...	...	$\frac{60}{125}$
Short Farthing	= ½ do.	...	·0	0	0	$\underline{5}$ *b*	=	...	...	...	$\frac{30}{125}$
	£ *(a)*	1*(c)*	·9	5	6	...	£*(a)*	3	18	3	$\frac{15}{125}=\frac{3}{25}$

IMPERIAL MONEY TABLE.						STERLING EQUIVALENTS.			
£	D.	C.	M.	D. M.	DENOMINATIONS.	£	S.	D.	F.
...	·0	0	0	1	= 1 Decimil	...	...	...	$\frac{6}{125}$
...	·0	0	1	...	= 10 Decimils = 1 Mil .	...	...	...	$\frac{60}{125}$
...	·0	1	...	...	= 10 Mils = 1 Cent .	...	...	4	$\frac{100}{125}$
...	·1	...	...	...	= 10 Cents = 1 Dime .	...	4	...	...
1	...	...	...	...	= 10 Dimes = 1 £ Imp.	2	...	...	...
1	·1	1	1	1	£	2	4	5	$\frac{41}{125}$

CONVERSION INTO STERLING OF SUM OF IMPERIAL MONEY TABLE.

£1·1111
2
£2·2222
20
s. 4·4440
12
D. 5·328
1000 = $\frac{41}{125}$
£2 4s. $5\frac{41}{125}$d.

CONVERSION INTO STERLING OF IMPERIAL SUM OF COINS.

£1·956—*(c)*
2
£3·913
20
s. 18·260
12
D. 3·12 = $\frac{3}{25}$
100
£3 18 $3\frac{3}{25}$

Note (a) (a).—The distinction between the Pound Imperial and the Pound Sterling in accounts is marked by the former not having the £ crossed by the line used for the latter.

Note (b) (b) (b).—The lines under the respective Five Decimils, are what would be used in accounts where they might be kept to the nearest farthing, a line being in all such cases used instead of the (5) Five, as shown in the Sum (c) and Example of Conversion (c).

N.B.—With only three decimal figures, and the use of this short horizontal line, there can be expressed what in the vulgar fractional system would require six fractional figures *and* a line:

Example—£1161 17 11¼ = £580·948—

A SUGGESTION

FOR THE INTRODUCTION OF A COMPLETE

BRITISH DECIMAL METALLIC CURRENCY,

AND THE ADOPTION OF A

BRITISH DECIMAL SYSTEM OF ACCOUNTS,

BASED ON RAISING THE INTEGRAL UNIT OF

ONE POUND STERLING, VALUE TWENTY SHILLINGS,

TO

ONE POUND IMPERIAL, VALUE FORTY SHILLINGS;

WITH TABLES AND ILLUSTRATIVE EXAMPLES.

BY

C. A. MANNING,

FREMANTLE, WESTERN AUSTRALIA.

1866.

SECOND EDITION.

COMPARATIVE EXAMPLE OF THE TWO SYSTEMS.

	SUGGESTED IMPERIAL SYSTEM.					STERLING SYSTEM.								
						STERLING SYSTEM DECIMALISED.					EXISTING VULGAR FRACTIONAL SYSTEM.			
	Pounds Imperial.	Dimes or Dollars.	Cents.	Mils.		Pounds Sterling.	Dimes or Florins.	Cents.	Mils.		Pounds Sterling.	Shillings.	Pence.	Farthings.
	£	D.	C.	M.		£	D. or F.	C.	M.		£	S.	D.	F.
(1)	58	·8	9	7–	=	117	·7	9	5	=	117	15	10	¾
(2)	62	·6	8	1	=	125	·3	6	2–	=	125	7	3	...
(3)	54	·6	1	2–	=	109	·2	2	5	=	109	4	6	...
(4)	580	·9	4	8–	=	1161	·8	9	7	=	1161	17	11	¼
(5)	150	·5	9	5	=	301	·1	9	...	=	301	3	9	½
(6)	£907	·7	3	4–	=£	1815	·4	6	9–	=£	1815	9	4	½

The several Amounts in the Imperial Example would be read thus :—

(1) Fifty-eight Pounds Eight Hundred and Ninety-seven and a half Mils Imperial.
(2) Sixty-two Pounds Six Hundred and Eighty-one Mils Imperial.
(3) Fifty-four Pounds Six Hundred and Twelve and a half Mils Imperial.
(4) Five Hundred and Eighty Pounds Nine Hundred and Forty-eight and a half Mils Imperial.
(5) One Hundred and Fifty Pounds Five Hundred and Ninety-five Mils Imperial.
(6) Nine Hundred and Seven Pounds Seven Hundred and Thirty-four and a half Mils Imperial.

A SUGGESTION

FOR

A BRITISH DECIMAL CURRENCY AND DECIMAL SYSTEM OF ACCOUNTS,

THE INTEGRAL UNIT BEING

ONE POUND IMPERIAL, VALUE FORTY SHILLINGS.

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§ 1. Economy of Time and Labour is the chief characteristic of all the industrial advancements effected within the present century, in most of which Great Britain has surpassed all other nations. The amount of muscular work economised by Great Britain alone during the last fifty years would, if accurately computed, seem, at first sight, even to men of great practical knowledge, a monstrous exaggeration. And yet, through some inexplicable anomaly, Great Britain has lagged behind many other civilised communities in the emulative race for economy of Brain Labour, and that in the very line which runs parallel with her Titanic manufacturing power, and her world-embracing foreign commerce.

§ 2. This anomaly is her obstinate adherence to a complex variety of Tables of Weights and Measures, and her permanent resistance to their being made uniform and decimalised, and her hitherto yet more stupid opposition to the Decimalisation of her Monetary System.

§ 3. Of late, however, an inclination has been shown towards a Decimal Currency by the issue of the Florin and the discontinuance of that of the Half-Crown, although the recently-coined new penny piece—a monetary fraction quite incompatible with Decimalisation—seems to indicate a continuance, for a time at least, of the present Sterling Vulgar-Fractional System.

§ 4. It is unnecessary here to demonstrate the numerous advantages of Decimal over Vulgar-Fractional Arithmetic. Indeed, on most occasions, it is a waste of time and labour to argue upon such subject at all. Those who are opposed to Decimal Systems can have no proper knowledge of them, and ought not to be reasoned with, but should be advised to learn and become familiar with decimal computations, and then judge for themselves.

☞ § 5. Believing, as the writer has above hinted, that the Decimalisation of British Currency and Account-keeping is but a question of time, his suggestion is a change of the Integral Unit from Twenty Shillings (value of the Pound Sterling) to Forty Shillings (value of the Pound Imperial), and that this new System be generally known as

THE IMPERIAL SYSTEM.

§ 6. The easiest operations in Arithmetic are doubling and halving—that is, multiplying and dividing by two. By adding the present Integer to itself, 20 + 20 = 40, an Integer of far more general utility is made the standard, the tenth of which—Four shillings—is the Par Value of the universally-known Spanish or American Dollar, into which Currency more than half the Sterling value of British Exports and Imports has to be exchanged; a fact which alone ought to call attention to the importance of the present suggested System.

§ 7. In the Frontispiece there is a Table of the Coins that would constitute the Imperial Metallic Currency.

They are twelve in number; the respective value—Imperial and Sterling—of each being shown in the corresponding columns. The sum of the Imperial column is converted into Sterling Vulgar-Fractional Currency, the operation being, as an example, worked out at length at the foot of the Sterling column, with the sum of which it agrees to a point. By that example it will be seen that the Sterling *Decimal* amount is just double the Imperial amount. Hence the two systems are so readily converted one into the other.

§ 8. The Double Sovereign (Pound Imperial) and the Double Florin (Dime) would be very useful additions to the existing Currency, even should there be no change contemplated, and ought to be issued in larger quantities than the Sovereign and Florin. One thousand Pounds would be more speedily counted in Forty-shilling pieces than five hundred Pounds in Sovereigns, and one hundred Pounds in Double Florins more readily than fifty Pounds in Florins, besides lessening the risk of error. The very large amount of Paper Currency in Great Britain and her Colonies, together with her well-organised Banking System, has prevented the inconvenience from the small dimensions of the Sovereign and Florin being generally noticed and objected to. Persons who, like the writer, have for many years carried on business in countries where the Doubloon and Dollar were in large quantities daily changing hands, and where public credit was usually at a low ebb, private credit little developed, and Banks had no existence, feel that the smallness of the Sovereign and Florin, when having to be counted beyond a moderately small amount, is really a great and painful inconvenience.

§ 9. The retention of names similar to those coins now current for the analogous coins to be issued under this system would greatly facilitate, amongst all classes of people, their welcome reception; and the knowledge of their exact equivalent sterling value would be generally extended if such value was inserted in the respective dies, thus—

Dime	4	Shillings.
Cent	5 = 1	Florin.
Half Cent	5 = 1	Shilling.
Quarter Cent . . .	5 = 1	Sixpence.
Mil	25 = 1	Shilling.
Half Mil	25 = 1	Sixpence.

§ 10. In account keeping, under the Imperial System, the fractional portion of any amount entered into Account Books is limited, as a general rule, to *Three Decimal Figures* and a short horizontal line called the *Half-Mil Line.* This allows the Sixpence to be retained as one of the Imperial Current coins, its Imperial Equivalent being ·0125, which would be entered in Books thus—·012–. But if it were found requisite to carry computations a tenth lower, and enter the results in subsidiary books, the fractional portion would then consist of *Four Decimal Figures* and a short horizontal line, then called the *Half-Decimil Line*, thus—·1812– (7s. 3d.)

§ 11. The present Currency need be no more disturbed by the additional issues here recommended than were preceding Currencies by the *Sovereign*, the *Half-Sovereign*, the *Florin*, the *Fourpenny* or *Threepenny piece*, or the recently issued *Penny piece*, (so frequently mistaken for a *Half*-penny.) Those coins not wanted in the Decimal System would no longer be issued, but would continue to be legal tenders, and left, like the Current Half-Crown, to wear away as they circulated, until their diminution of weight and their effacement rendered them no longer passable, when they could be called in without any inconvenience to the general public.

§ 12. Nor need there be any sudden coercive change, public or private, in the method of keeping Accounts. If the suggested System be approved of, it would naturally be encouraged, and accountants be directed by their employers to familiarise themselves with its working, as a time would arrive when accounts would be transferred to new sets of Books to be kept according to that System. These directions would be the more readily complied with, as the Tables given herewith to facilitate the conversion of Sterling money into Imperial money, and comprising also Sterling Decimal Equivalents, will be found very useful even under the existing System. Tables I. and II. ought to be hung up in every office, as numerous calculations can be more readily performed by these equivalents than by the ordinary method. Such calculations are of Interests, Commissions, Premiums, Discounts, Foreign Exchanges, &c., of which examples are given. Tables III., IV., and V. of Percentages, corresponding to Pence-rates of exchange between Pounds and Dollars, ought likewise to have their place in all offices connected with Foreign Commerce, in which the Dollar plays so conspicuous a part. Indeed, for exchanges between British Currency and Dollars these Tables are more useful than Table II., as many examples herewith given will show. They are applicable under the existing System by converting the shillings, pence, and farthings to a decimal fraction, by means of the Sterling Equivalents in the Table, and multiplying the whole amount by five (5) to obtain the Par Value (48d.) This, in reality, is converting the Sterling into Imperial money, and at the same time multiplying it by 10. Thus £120, 16s. 0d., to be exchanged at Par, turning the 16s. into a decimal fraction of a Pound Sterling is £120·8, and this multiplied by 5 = $604· = £60·4 Imperial. It is here to be noticed that if the Sterling System were decimalised,—that is, by converting the fractional portion of any amount into decimals of the Pound Sterling,—the multiplication by 5 would, to get the Par Equivalent, be a requisite preliminary operation, which under the Imperial System is not required; the removal of the Point one figure to the right gives at once the Par Equivalent.

§ 13. Now attention is particularly called to the fact that when the time arrived for a convenient opening of new Account Books under a Decimal System, the adoption of the one here offered would be quite as easy as retaining the present Sterling Integer, and decimalising the shillings, pence, and farthings. A Ready Reckoner, or Tables, as Nos. I. and II., would be indispensable in the one case as much as in the other. Two accountants would, in either case, be necessary, unless the transfers were but a few in number. One accountant to call out the amount from the Old Book, (Sterling,) the other to enter it into the New Book, (Imperial;) whilst the latter would be setting down the Integral portion, the former would readily find in the Table the Decimal portion; the only difference being that with a Sterling Decimal System there would be called out the same Integral amount as seen in the Old Book, whilst under the Imperial System, if an even number, it would be halved; if an odd number, the next lower even number would be halved—a mental process of such extreme facility as to be within the limit of a very low arithmétical capacity. Thus, if the transfer of £120, 16s. 6d. were being made, the accountant at the Sterling Book would call out 60; then looking into Table I., he would opposite 16 find ·4, which he substitutes for the initial Zero opposite 6d. in Table II., Column T, and calls out ·412 *Line*, (·412–.) If the amount be £121, 16s. 6d., he calls out, as before, 60; and in Table I., opposite 36 (20 + 16) finds 9, which he substitutes for the initial Zero in Column T, (Table II.,) opposite 6d., and calls out ·912 *Line.* But, after a little practice, Table I. never need be inspected. The Integral portion would be halved, as above directed, the shillings divided by 4, which would give the Dime figure, and the residue would be found in Column T, Table II. Thus to transfer £213, 11s. 5½d., the mental process is thus: half 212 is 106. Twenty (the odd pound) and 11 are 31. Thirty-one divided by 4, give ·7, (the Dime figure,) and a remainder of 3s. 5½d., which being sought in Column T, (the fourth column of Table II.,) there is found opposite to it ·086–. The Imperial Equivalent, therefore, of the whole amount is £106·786–. Although this process is shown in the explanations to Tables I. and II., it is a subject of so much importance, that it is repeated here to stamp it more deeply in the reader's mind; for if he can but be brought to understand clearly, and by practice convince himself, that most of the arithmetical work of his office can be performed with greater ease and speed, and with less risk of error, by using the Tables here given than by his present methods, he will the more readily be inclined to adopt it, and advocate the change suggested of doubling the value of the Integral Unit, and establishing the Imperial System.

§ 14. All changes are necessarily irksome, and, to some degree, laborious; they involve the destruction of long-established courses of action, and the obliteration of familiar habits of thought. But about the middle of last century the Calendar was rectified, and eleven days struck out of the then current year. "What a confusion!" many persons said at the time, and predicted that the Bill for the change would not be sanctioned by the Legislature. The Bill, however, was sanctioned, and the change effected.

§ 15. It is within the personal recollection of many who have not yet arrived at a very advanced period of life, that Steam navigation was expected to be a failure, if attempted out of rivers, lakes, or smooth water, on short sea passages; and that Stephenson was snubbed by noble Lords for talking *such nonsense* as travelling on railroads at the *dangerous high rate of speed of twenty miles an hour!* Yet these and numerous other changes, considered as equally impracticable by nearly all those to whom they were first suggested, have been realised within the last fifty years. *Dreams* of harmless lunatics (as the projectors were thought to be) have become mighty *facts;* indicators of yet further victories of Mind over Matter, and stimulants to an accelerated progress in the transcendental ways of ever-expanding knowledge, and its useful application towards increasing the comfort, happiness, power, and dignity of Man.

§ 16. The change in the British Monetary System herein proposed would, if carried out, be merely a *temporary* expenditure of time and labour for the purpose of obtaining a *future permanent* economy of these important items, not only in the daily practice of commercial life, but also in the arithmetical education of youth. It would be the investment of a minute portion of those two items, which are the primary foundations of national wealth, with the certainty of an incalculably immense return in compound interest accruing therefrom.

§ 17. And if, with the now almost general intellectual advancement of every nation, the uprooting of prejudices, and gradual abolition of all that is found out to be either detrimental or useless, however time-honoured, a Congress of Delegates were to meet, being by their several national constituents duly authorised to agree upon the establishment of *one same standard for all Metallic Currencies*, and whilst each nation retained its distinctive stamps and inscriptions, or introduced others according to its political conveniences, *precisely the same weight* were fixed for all *corresponding Coins*, an immense boon to each, and to the world at large, would be the certain and fruitful result. Thus a Pound Imperial (a Forty-Shilling Gold Piece) would be of the same intrinsic value as a Fifty-Franc Gold Piece, and as a Ten-Dollar Gold Piece; a Sovereign of the same intrinsic value as a Twenty-five-Franc Gold Piece, and as a Five-Dollar Gold Piece, &c. A Double-Florin (Imperial Dime or Four-Shilling Silver Piece) would be of the same intrinsic value as a Five-Franc Silver Piece, and as a Spanish or American Silver Dollar, &c. And here it must be specially noticed that in this universal adoption of *an equal standard* for Gold, Silver, Copper, or Bronze, (or other inferior metal, as might be generally fixed upon,) and of *an equal weight of corresponding coins*, it is by no means necessary that the subdivisions should be the same in all parts of the world. In some countries metals inferior in value to silver are not used for coins. The only requisite is that the *subdivisions of the corresponding* coins should have *one same standard*, that is, be of an *equal degree of fineness.* Take, for instance, England, France, Spain, the United States, Mexico, and the Republics of South America: four English Shillings, or two Florins, would be intrinsically equivalent to five Francs, to two Half-Dollars, or four Quarter-Dollars, or eight Rials. So that, disregarding the balance of trade, costs of transport of specie, insurance, brokerage, &c., A would receive from B in payment precisely the same value, intrinsically, in all parts of the world, whatever might be the nationalities of the coins with which the payment were made, supposing no loss in weight existed: he might, indeed, take it by weight, without the trouble of counting. Is it not probable that this general adoption of the same standard throughout, and same *weight for corresponding coins*, would tend to improve a feeling of concord among all nations?

§ 18. There is something truly absurd in the present arrangement of British School Books of Arithmetic. They begin and continue as far as Simple Division on a Decimal basis, pointed out by Nature, in the fingers or digits of the human hand. The child is taught that a single figure is one or more *units* up to nine inclusive; that a figure placed before it towards the left is one or more *tens* up to ninety, inclusive; that a third figure on the same side is one or more *hundreds* up to nine hundred, inclusive; and that the rule is, that a figure in each successive place on that side towards the left is in value *ten times more* than what it would be if holding a place next to it on the right. Now, why cannot the child be taught at the same time, that a point, called the Decimal Point, shows the lowest limit in value of those figures which are called Integers, whole or unbroken numbers commencing with the figure 1? Why cannot the child be taught that each figure to the *right* of that point is successively in value *ten times less* towards the right than it would be if holding a place next to it on the left? In short, why not first teach the child Decimal Arithmetic? Afterwards, it might be taught how to turn the figures on the right of the point, namely, the fractional or broken part of 1, into *any* other subdivisions, broken parts, fractions of 1, found in the *barbarous Tables* of Moneys, Weights, Measures, &c., which have been so long a thorough disgrace to British Civilisation. Instead of this, a child is set to work in vulgar fractions, after learning the four first rules of arithmetic, as they are called, purely decimal, as above shown; these said *four first* rules, let it be said *en passant*, being in reality only *two*. The poor misused child is perplexed with these vulgar fractions, its memory strained, its unformed and weak brain injured, its very bodily health, as a necessary consequence, deteriorated for a time, and that which saves it from permanent bad results is, fortunately, its inattention and the dislike engendered in its mind to arithmetic in general. It looks upon Decimals as something scarcely attainable by its understanding. It regards them with a degree of awe somewhat akin to that in which it views Algebra and Logarithms. It is shut out from ever knowing, at least in this life, the music, the true vital harmony of numbers, so strengthening to its cerebral health; for how few persons born and educated in the British Empire retain, after leaving school, any arithmetic beyond that which is indispensable in the routine of their daily avocations! To ninety-nine out of every hundred British men who have gone through years of scholastic or even collegiate education, Decimals are as unknown and as awful as to boys; the cause being, that they never really learnt decimals, and therefore remain ignorant of the means of saving time and labour, of diminishing the risk of error, of detecting it readily and easily when an error occurs, and many other advantages which would force themselves on their attention, if all their calculations were based and worked out on a decimal system.

§ 19. A few months ago we learnt that the Pope had established a Decimal Currency, but we are not informed on what Integral Unit based; nor with what subdivisions or multiples. The previous currency could, without much inconvenience, have been readily assimilated to the Imperial System here suggested. A short Bajoccho (the short Halfpenny) would be the Imperial *Mil;* a short Poalo (= ten short Bajocchi) would be the Imperial *Cent*, (the long Fourpenny piece;) ten short Poali, composing the new Scudo, would be the Imperial *Dime*, (the Double-Florin;) and ten new Scudi, forming the Integral Unit, a Gold Piece called the Dëscudo or Petro, (or such other name as might be found most suitable,) would be the Pound Imperial, (the Double-Sovereign.) In the eighteenth century England followed the example of Pope Gregory in the rectification of the Calendar, and one of the objections to the change, amongst the narrow-minded, was this very fact of its being a Papal innovation, and therefore the example, as savouring of Popery, ought by no means to be followed. It is to be hoped that England, in the nineteenth century, will not long hesitate to steer into the wake of a truly sensible course, without any objection being raised on account of the Mitre and Cross Keys on the flag of Pope Pius.

§ 20. In the contemplation of a change to a Decimal System in the British Currency, it would appear by the issue of the Florin, as noted in § 3, that the Pound Sterling would still continue to be the Integral Unit. In Barnard Smith's Arithmetic, edition 1862, pages 125 to 129, treating on Decimal Coinage, this is the only system proposed, and a Table given to that effect, viz., 10 Mils make 1 Cent, (c.,) 10 Cents make 1 Florin, (fl.,) 10 Florins make 1 Pound, (£.) In Colenso's Arithmetic, edition 1865, there is first given a system having for basis the farthing, chiefly for what in the writer's opinion is an extremely weak reason, namely, not to disturb the existing circulation of the smallest coins among the poorer classes, and their use in the payment of tolls, &c. Such a system cannot be thought of. Colenso next gives the same system as Barnard Smith, keeping to the Pound Sterling as the Integral Unit: that is, not looking beyond the domestic requirements; for which, indeed, the Sterling Decimal System is amply sufficient. They, like many other writers and individuals of various classes who advocate the Decimalisation of the British Currency, ignore entirely or disregard foreign trade, and the utility of assimilating this Currency, when the change took place with that of other nations, and providing for the easiest method of computation of the numerous amounts, making up an aggregate of upwards of two hundred millions Sterling per annum—equal to, if not exceeding, the annual aggregate of domestic amounts. Who, knowing this, could be opposed to the change, when effected, being for the benefit of both requirements, domestic and foreign? Here is seen the difference between theory and practice. Had the gentlemen above named, instead of a collegiate life, passed, as the writer has done, forty years out of England, in constant commercial intercourse with many different countries, maintaining during the same period a like intercourse with England, the need of harmonising the British monetary system with the monetary systems of the other principal nations of the Earth, could not have escaped their notice. It would have forced itself upon them, as it did upon the writer—who, for a quarter of a century, has had some system analogous to the one here suggested floating in his mind; but nothing satisfactory, on all points, was clearly defined, until the idea of doubling the British Integral Unit presented itself. And then, the further this idea was pursued, the clearer and clearer the prospect became; the more the practical results were examined in their various details, the more the system developed itself to the writer's satisfaction—so much so, that after constructing a few Tables, as ready reckoners, he frequently worked by them, or found them useful in checking computations made in the usual office way. But it was one thing to have the complete system before him and work by it himself, and quite another thing to place it, with equal clearness, before even willing readers, and attract the attention of any one belonging to that numerous class who take fright at the very name of Decimals. To do this was a truly arduous task. He knew that to give a mere outline, and call on others to fill in the details, would be a waste of labour and time. The system must be presented in a perfectly developed form: a metallic currency disturbing as little as possible the existing one must be proposed, all reasonable objections foreseen and prepared to be met, either by a brief argument, not to be fairly controverted, or by illustrative examples no less convincing; short but comprehensive Tables given, and so arranged and explained as to enable all who might be desirous of testing the system to do so with facility; and, in fine, he had on the whole to place himself in a position to say to a willing hearer or reader, "You have here a Decimal Monetary System for the British Empire, adapted both to her two hundred millions or more yearly of domestic trade and to her two hundred millions or more yearly of foreign trade. You will find all *cut and dry* for you. Therefore try it, and judge for yourself." Whether he is in that position or not, the verdict of a sufficient number of unprejudiced and impartial judges can alone decide. Be that verdict what it may, the writer now concludes by offering THIS SUGGESTION FOR A BRITISH IMPERIAL SYSTEM OF CURRENCY AND ACCOUNTS to his fellow-countrymen.

FREMANTLE, WESTERN AUSTRALIA,
28th December 1866.

EXPLANATION OF THE TABLES.

Table I. gives the exact Imperial and Sterling Decimal Equivalents of the several tabular divisions of the Shilling—namely, from one *half-farthing* to eleven-pence; and from one shilling to forty shillings. The equivalents of the farthings and pence, when such equivalents become infinite, are carried on to the last figure preceding the repeating one; and rendered finite by substituting the vulgar fractions ⅓ or ⅔, for the decimal fraction ·333~ or ·666~ Any quantity can be readily computed by the use of this Table, as shown in the following example :—

Quantities.	Sterling.									IMPERIAL.					
	Vulgar Fractional				Decimal.										
	Rates	£	s.	d.	Rates.	£	f.	c.	m.	Rates.	£	d.	c.	m.	dm.
4248	at ¾d	13	5	6	at 31¼ DM	(a) 13	·2	7	5	at 15⅝ DM	(b) 6	·6	3	7	5
4248	at 3d	53	2	—	at 1¼ c	(c) 53	·1			at ⅝ c	(d) 26	·5	5		
4248	at 6d	106	4		at ¼ f	106	·2			at ⅛ D	53	·1			
4248	at 2s	424	16		at 1 f	424	·8			at ½ D	212	·4			
4248	at 14s	2973	12	—	at 7 f	2973	·6			at 3½ D	1486	·8			
4248	at 17s	3610	16		at 8½ f	3610	·8			at 4¼ D	1805	·4			
	£	7181	15	6	£	7181	·7	7	5	£	3590	·8	8	7	5

Computations.

(a)

Amount ÷ 1000 = 4·248

× 3 = 12·744

1 = ·4248

÷ 4 = ·1062

£ 13·275

(b)

10 DM 4·248

5 2·124

½ = ÷ 10 = ·2124

⅛ = ÷ 4 = ·0531

£ 6·6375

(c)

1 = 42·48

¼ = 10·62

£ 53·1

(d)

42·48

½ = 21·24

⅛ = 5·31

£ 26·55

But the principal object of this Table is to facilitate the finding of the *Dime* figure, or the First Decimal which has to occupy the place of the Dime Zero in Table II. To good accountants it will be quite unnecessary, as likewise, after a short practice, to most persons; as they will readily perceive that for *Sterling Decimal Equivalents* the Dime figure must be for any amount *under*

Two shillings, (as in the Table,) ·0

For 2s. and under 4s., ... ·1

„ 4s. „ 6s., ... ·2

„ 6s. „ 8s., ... ·3

„ 8s. „ 10s., ... ·4

„ 10s. „ 12s., ... ·5

For 12s. and under 14s. it must be ·6

„ 14s. „ 16s. „ ·7

„ 16s. „ 18s. „ ·8

„ 18s. „ 20s. „ ·9

And that for *Imperial Equivalents* the Dime figure must be, for any amount under

Four shillings, (as in the Table,) ·0

For 4s. and under 8s., ... ·1

„ 8s. „ 12s., ... ·2

„ 12s. „ 16s., ... ·3

„ 16s. „ 20s., ... ·4

„ 20s. „ 24s., ... ·5

For 24s. and under 28s. it must be ·6

„ 28s. „ 32s. „ ·7

„ 32s. „ 36s. „ ·8

„ 36s. „ 40s. „ ·9

But to many persons unaccustomed to mental arithmetic it may for a time prove useful, as they can, by inspection, at once find the proper Dime figure in this Table.

Table II. consists of four columns of Decimal Equivalents to Sterling Vulgar-Fractional amounts, from half a farthing, by successive farthings, to four shillings. The two first columns contain both Sterling and Imperial Equivalents, ending at two shillings: the last two columns contain Imperial Equivalents only.

In the first edition of this pamphlet the Sterling Equivalents were not inserted in these Tables; but it having been considered that they would be found useful in computations under the existing system, by clearing away fractions, of which examples are given at the end of this explanation, their insertion in the second edition was thought desirable.

Table II. is of immense utility in various ways; and is a ready reckoner for the conversion of Sterling into Imperial money. Two examples will be sufficient to show the ease and quickness with which, by the aid of this Table, such conversions can be effected.

Ex. 1st. Required the Imperial Equivalent of £126, 17s. 6d.
Half 126=63·
Table I. Dime figure for 16s.= ·4
Table II. Imperial Equivalent for 1s. 6d.=·0375
Imperial Equivalent=£63·4375

Ex. 2d. Required the Imperial Equivalent of £1761, 18s. 11¾d.
Half 1760=880·
Table I. Dime figure for 36s.= ·9
Table II. Imperial Equivalent for 2s. 11¾d.=·0745
Imperial Equivalent=£880·9745

These additions are, in practice, quite unnecessary, and are merely placed here to demonstrate to the reader, as clearly as possible, the details of the operation. In practice the accountant would halve the Pounds Sterling, if an even number, and set down the quotient, annexing thereunto the proper Dime figure and Imperial Equivalent shown in the Table. Thus, for £124, 3s. 6d. he sets down 62· (the half of the Integer,) and annexes to it ·0875, making in one line £62·0875.

Should the Sterling Integer be an odd number, (say £125, 3s. 6d.,) the accountant halves the nearest lower even number, namely, 124, and sets down 62·; and as the *Dime* figure for £1=20s. is ·5, he annexes thereunto that figure and the equivalent of 3s. 6d. in the Table; making in one line £62·5875.

Each column of Equivalents is subdivided into two other columns. The first headed S. P. F., (Shillings, Pence, and Farthings,) and T., (Transfer;) the second, headed *Pence*, and F., (Fractions or Farthings,) and C., (Computations.)

Column T. is so arranged as to give in three Decimal figures, or in three Decimal figures *and* a short horizontal line (-), called the *Half-Mil Line*, the nearest approximate equivalent within such limits to any amount of pence and farthings between one half-farthing and forty-eight pence. It is only perfectly correct in the Imperial Column T. at the Sixpences, and in the Sterling Column T. at the Threepences, Sixpences, and Ninepences. The Imperial approximations are minus from one farthing (where the difference from perfect exactness is a minimum) to 3d., (where the difference is a maximum,) just one quarter of a mil, about half a farthing. From 3¼d. (where the difference is greatest) to 5¾d. (where it is least) they are plus. They become minus from 6¼d. to 8¼d., and then again plus from 8½d. to 11¾d. It may be further noticed that,

Whereas 3d. is minus, being ·006 instead of ·00625
Its multiple 9d. is plus, being ·019 instead of ·00875
12d. = 1s. = £–·025 = £–·025

the sum of the two giving an exact Equivalent.

By comparing Column T. with Column C. in those of the Sterling Decimal Equivalents, it will be seen that the former (T.) is likewise arranged on a compensative principle, different however, necessarily, from the analogous Column (T.) in the Imperial Equivalents.

In the comparative examples of the two systems, Sterling Vulgar-Fractional and Imperial, in Addition and Subtraction, the use of the Imperial Column T. will be found sufficiently exemplified.

They show the arithmetical process of transferring a series of amounts from books kept in the existing Sterling System to books opened for the Imperial System. The accountant must, of course, attend to whether any number of consecutive amounts, belonging to one same account, compensate one another, or whether the greater part are *plus* or *minus*. If *plus*, he will, at the equivalents nearest to a maximum of difference, suppress one or more of the half-mil lines; if *minus*, he will, at the equivalents nearest to a minimum of difference, add one or more of these lines. In the sum of the columns of the comparative examples in Addition there is on the Imperial side an excess of $\frac{61}{100}$ths of a penny, which by suppressing the *half-mil lines* in the two amounts marked with an asterisk, would be reduced to $\frac{11}{100}$ths only, less than the equivalent of half a farthing.

Column C., for computations, contains the *exact* * Equivalents of every amount expressed in pence and farthings up to *Two* shillings for Sterling Decimals, and to *Four* shillings for Imperial Decimals, and serve, as previously pointed out, for any multiple thereof, (2s. and 4s.,) by substituting for the initial Zero the proper Dime figure found in Table I. This being a matter of primary importance, it may not be a useless repetition to place before the reader the Imperial series with the Equivalents annexed, corresponding to Sterling Vulgar-Fractional amounts :—

	£	s.	d.		£	D.	C.	M.	DM.	£	s.	d.		£	D.	C.	M.	DM.
	–	–	9	=		·0	1	8	7–	2	–	9	=	1	·0	1	8	7–
	–	4	9	=		·1	1	8	7–	2	4	9	=	1	·1	1	8	7–
	–	8	9	=		·2	1	8	7–	2	8	9	=	1	·2	1	8	7–
	–	12	9	=		·3	1	8	7–	2	12	9	=	1	·3	1	8	7–
	–	16	9	=		·4	1	8	7–	2	16	9	=	1	·4	1	8	7–
	–	20	9	=		·5	1	8	7–	3	–	9	=	1	·5	1	8	7–
	–	24	9	=		·6	1	8	7–	3	4	9	=	1	·6	1	8	7–
	–	28	9	=		·7	1	8	7–	3	8	9	=	1	·7	1	8	7–
	–	32	9	=		·8	1	8	7–	3	12	9	=	1	·8	1	8	7–
	–	36	9	=		·9	1	8	7–	3	16	9	=	1	·9	1	8	7–
Sums ... £	9	7	6	=£	4	·6	8	7	5	£ 29	7	6	£	14	·6	8	7	5

	£	s.	d.		£ D.C.M.
Sum of 1st Sterling Column,	9	7	6	Sum of 1st Imperial Column,	4·687
Do. 2d do.,	... 29	7	6	Do. 2d do.,	... 14·687
	£38	15	0		=£19·375

---

* Exact, because the infinitely repeating figures 33∾ and 66∾ become finite by substituting for them respectively ⅓ and ⅔.

Conversion of £19·375 to £
2
£38·75
20
15s.

This example shows the utility of Column C. for computations. If the equivalent were taken from Column ·T. (·019) instead of ·01875, the difference, (a maximum,) 2½ Decimils, multiplied by 20, would have given an excess, in the total sum, of 5 mils, (say, a small fraction less than 2½d.;) whilst the equivalents of twenty amounts, ending with *different* pence and farthings, taken out of Column T., by the compensating principle above referred to, would not show in their sum a difference beyond the value of a half or a quarter of a farthing, perhaps not so much as this latter.

The Equivalents in Column C. are of infinite elasticity. An accountant need only take a sufficient number of figures to bring out a desired result, which shall be so far perfectly accurate. Thus, if he wants no more than two correct decimals in a sum or product, he will usually find four figures enough in any addition or multiplication of moderate length. Should he require more figures than are in the Table, he can diminish the value of the Equivalent to any extent, by prefixing Zeros. For instance, is the equivalent of the hundredth of a penny required, prefix two Zeros to the decimals given in the Table, and it is at once obtained, thus, $\frac{1d}{100}$th = ·000 020 83∾

On the other hand, by striking out initial Zeros, if any, and repeating, as far as needful, the figure 3 or 6 in the Infinite Decimals, or adding Zeros to those which are finite, he may express any multiple, by tens, of these equivalents. Thus £7291 666·666∾ is the Imperial Equivalent of a thousand million times threepence halfpenny (3½d.) = £14 583 333, 6s. 8d., and £687 500· is the Equivalent of ten million times two shillings and ninepence (2s. 9d.) = £1 375 000·–

Other illustrations of the foregoing and of the general application of Table II. will be found in the various illustrative examples given herewith.

Although the main purpose of this Table is to facilitate the conversion of Sterling into Imperial Currency, and smooth the way for the adoption and final establishment of the system suggested, the Sterling Decimal Equivalents may frequently be made use of with advantage under the existing system, as before stated, and as illustrated by the following examples :—

Ex. 1.—Reduce £64, 16s. 9¾d. to a Sterling Decimal Form. Here the Dime figure is ·8; and in the Sterling Column in a line with 9¾d. there is found under the head of T. ·040–; and under C. ·040625. The Decimal Form is thus for Transfer, £64·840–; and for Computations, £64·840 625.

Ex. 2.—Reduce £25, 11s. 10½d. to a Sterling Decimal Form. Here the Dime figure is ·5; and in a line with 1s. 10½d. in Column T. is ·094, and in Column C. ·093 75. The Decimal Form is thus for Transfer, £25·594; and for Computations, £25·593 75–.

Ex. 3.—Required the Commission @ 2½ per cent. on £125, 17s. 9½d. Here the Dime figure is ·8, and in a line with 1s. 9½d. in Column C. is found ·089 583 3∾; the Decimal Form is therefore £125·889 583∾; this divided by 10, =

=£12·588 958 3∾
2½ per cent. = $\frac{10}{4}$ = ∠ ÷ 4 = £3·147 239$\frac{7}{12}$
20
s. 2,94 479$\frac{2}{12}$
12
D. 11,33 75 Answer—Com. = £3, 2s. 11d. $\frac{3375}{10.000}$(=say ¼d.)

Ex. 4.—From Barnard Smith's Arithmetic, Ed. 1862, Practice, p. 157 :—

Find the value of 3825 things at £2, 17s. 4½d. each.

Here the Dime figure is ·8, and in Column C., in a line with 1s. 4½d., is found ·068 75 ; the Decimal Form is therefore £2·868 75. This rate, multiplied by 3000 = £8606·25
Rate 2·868 75 × 800 = £2295·
$\frac{100}{4}$ =< 25 = £ 71·718 75
3825 £10 972·968 75
20
s. 19,375
12
D. 4·5 = 4½d. Ans.—£10 972 19s. 4½d.

Ex. 5.—Required the cost of 15⅞ yds. @ 13s. 10½d. per yard.

Here the Dime figure is ·6, and in a line with 1s. 10½d. in Column C., is found ·093 75 ; the Decimal Form, multiplied by 10, is therefore 6 ·937 5 (Conversion) £11·0132–
5<÷ 2 = 3 ·468 7– 20
½<÷10 = ·346 8–
¼<÷ 2 = ·173 4– s. 0,265
⅛<÷ 2 = ·086· 7 12
15⅞ £11 ·013 2– Ans.—£11 0s. 3d.$\frac{18}{100}$ D. 3,18

The conversions of the Decimal Fraction into Shillings, Pence, and Farthings, instead of being computed as above, can readily be effected by the inspection of Table II. Thus for a Sterling Decimal, Ex. 1, £64·840 625, it is known that ·8=16s., and by inspecting Column C. of Sterling Decimal Equivalents, there is found 9¾ in a line with ·040 625 ; and the Sterling Vulgar-Fractional amount is therefore £64, 16s. 9¾d.

In Ex. 2 it is known that ·5=10s., and by inspecting Column C. (Sterling) there is found 1s. 10½d. in a line with ·093 75, whence the Sterling Vulgar-Fractional amount is at once seen to be £25, 11s. 10½d.

In Ex. 3 it is known that ·1=2s., and in a line with ·047 in column T. (Sterling) appears 11¼d ; wherefore £3·147=£3, 2s. 11¼d.

In Ex. 4 it is known that ·9=18s., and as in a line with ·06 875 (Column C. Sterling) appears 1s. 4½d., the Sterling Vulgar-Fractional value of £10 972 ·968 75=£10 972, 19s. 4½d.

And in Ex. 5, in a line with 0 135 nearest to ·01 325 appears 3¼d. ; whence £11·0 132–=£11, 0s. 3¼d. (very nearly.)

By a similar inspection of the Table (II.) Imperial Money can be converted into Pounds, Shillings, Pence, and Farthings, without the trouble of computation.

Thus in £63·437 5 it is known that double the Imperial Integral amount is the Sterling Integral amount ; that ·4=16s. ; and in a line with ·0375 (Column C. Imperial) there is found 1s. 6d. ; wherefore £63·4375= £126, 17s. 6d.

Again in £880.974 5 it is known that £880·5 is equal to £1761· ; the ·4 (difference between 9· and ·5)= 16s. ; and in a line with ·074– (Column T. Imperial) there is found 2s. 11¾d. ; whence £880·974– is equivalent to £1761, 18s. 11¾d.

Table III. of Decimal Equivalents of percentage rates, for pence rates of pounds into dollars, is constructed by taking the difference between the Pence rate of exchange and Par, (48d. ;) multiplying that difference by 100, and dividing the product by the Rate.

Thus for 41¾d. exchange per Dollar, 48d. less 41¾d.=6¼d.=25 Farthings; and 25×100=2500; and 41¾d.=167 Farthings. Therefore 2500÷167=14·970 059, &c.=Percentage for 41¾d.

When the exchange is at 54¼d., (the same difference from Par,) the computation is thus :—

54¼d., less 48d.=6¼d.; and, as before,=25 Farthings; and 54¼d.=217 Farthings. Therefore, 2500÷217 =11·520 737, &c.,=Percentage for 54¼d. per Dollar.

The percentages, where not shown as finite, are carried on to ten decimal figures for the exchange of large amounts, and will give accurate results up to One Hundred Thousand Millions (100,000,000,000.)

Where the fraction, so far as its computation extends, has not been found to circulate, the final figure shows less than the true percentage by the value of the remaining figures, when the first thereof is from 0 to 4 : and by their value of the excess over 5 from this latter up to 9.—That is to say, (6,1) (6,2) (6,3) and (6,4) are, in the Table, set down as 6, final figure; (6,6) (6,7) (6,8) and (6,9) are set down as (6–) for the final figure; which is done in order that when the whole of the figures are used, finite results may be obtained, by coming to *threes*, *sixes*, or *nines*. It is, however, extremely seldom that all the ten figures can be required.

Table IV. of Decimal Equivalents of percentage rates for pence rates of Dollars into Pounds is constructed by taking the difference between the rate of exchange and par, (48d.;) multiplying that difference by 100, and dividing by par itself (48d.) Thus for 41¾d. exchange per dollar 48d. less 41¾d.=6¼d.=25 farthings; and 25×100=2500; and 48×4=192. Therefore 2500÷192=13· 020 833, &c., is the percentage rate of 41¾d. for Dollars into Pounds.

When the exchange is at 54¼d., which is at the same difference from par as 41¾d., the percentage is precisely the same, the division (par) being a constant quantity.

This equality at the same difference from par on either side (plus or minus) admits of the condensation of Table IV. into that given as Table V.—which latter, in many cases, will be found to be much handier than the former. Examples of the application of these Tables are given with them, whereby it will be seen that to obtain the PAR equivalent the Sterling Decimal amount must be multiplied by Five, (in reality converted into Imperial money,) which operation is avoided in the system suggested, (Imperial.) Thus, in Example No. 3, following Table V., for the exchange of £193 17s. 11¾d. into Dollars at 45d. per Dollar, the Imperial amount (if the system were adopted) would be £96·949–; and, by removing the point one figure towards the right, the Par equivalent, in Dollars, is at once found, namely, $969·495, and the exchange at 45d. is computed by adding thereunto to the amount, multiplied by ·03 = 32·316–

And repeating same ·03 = 32·316–

6·66∽ =⅔÷100=·06 $1034·128

which is a minute fraction of a mil over perfect accuracy, (see Examples 1, 2, 3, 4, under the head of Exchanges in the Illustrative Examples;) the equivalent of 1s. 11¾d., taken from Column T., (Imperial ·049–,) being slightly in excess of the exact equivalent in Column C. (Imperial ·049 479 16∽.)

The rapidity and ease with which the above exchange is computed, and many more similar examples could be given, ought to demonstrate, triumphantly, the great advantage of the Imperial System here suggested, to a nation like Great Britain and its dependencies, having to the extent of several hundred millions of Pounds Sterling to be computed annually for exchanges between these and Dollars.

Table VI. of Decimal Fractions of a year of 365 days is indispensable under a Decimal System. It is computed, on the basis of this number being the product of only two factors, both prime numbers (5 and 73.) Each 73 days is, therefore, one-fifth of the year, and, of course, readily gives the interest for that number of days, by dividing the annual interest by five; and the interest for any less number of days can easily be computed from the corresponding fraction in the Table, as shown in the following examples :—

Ex. 1.—Required the interest @ 10 per cent. per annum on £130 6s. 4d. for 192 days.

The Imperial Equivalent amount=£65·1583∼

(Table II., Column C.,) and the interest thereon for 1 year 6·51583

Decimal Fraction of the year for 146 days ·4 ×– – ·5= 3·25791

Do. do. do. for 46 days ·126027 :2= ·13031

Do. do. do. for 192 days=·526027 .·.6= ·03909

£ 3·4=£6 16s. 0d. :$_{5}$:02= ·00130

(Table II., Col. T.,) ·029= 1s. 2d. :$_{6}$:7 = ·00042

Ans.—£6 17s. 2d. £3·429

Ex. 2.—Required the interest @ 10 per cent. on £102 14s. 4d. for two years and 280 days.

The Imperial Equivalent amount=£51·3583∼

Interest for 1 year=£ 5·13583∼

Ditto for 1 year= 5·13583∼

Fraction of the year for 219 days=·6 < + ·7= 3·59508

for 61 =·167123 :6= ·30814

280 =·767123 .·.7= ·03595

::1= ·00051

£14·2 = £28 8s. 0d.

(Table II., Col. T,) ·011–= 5½ £14·2113

Ans. £14·211–= £28 8 5½

Ex. 3.—Required the simple interest and amount of £106, 13s. 4d. at 4½ per cent. per annum for 95 days, (B. Smith, Ed. 1862, p. 229.)

The Imperial Equivalent amount=£53·333∼

< ×·04 = 2·1333

·005 = ·2666

Interest of 1 year— £ 2·4

Fraction for the year for 73 days=·2 ·2= ·48

for 22 =·060273 ·06= ·144

for 95 =·2602 : 2= ·0004

£ ·6244

	£	s.	d.
£·6	1	4	0
(Table II., Col. T.,) ·024–=	0	0	11¾
£·624–=	1	4	11¾=Interest for 95 days.
Principal	106	13	4
	£107	18	3¾=Amount.

Table VI. gives the Decimal fractions of the year to nine figures for the convenience of computing the interest on large amounts. But, as seen above, it is seldom that more than five or six can be required.

Note.—As no accountant, particularly if alone, should ever rely on one mode of working, he will find the application of the Tables here explained an easy and expeditious way of checking results of other methods, even under the existing System.

USEFUL HINTS

TO

FACILITATE DECIMAL COMPUTATIONS IN GENERAL.

---

§ 1. It is well to acquire the habit of placing the Decimal point in the centre of the perpendicular line of height of the figures, and nearer to the Dime figure than to the units of the Integer: thus (21 ·6) (35 ·8.) If placed on the foot-line, as generally taught in Books of Arithmetic, a 1 followed by a Decimal point, both hastily set down, might be mistaken for a 4, and a full stop for the Decimal point. Such errors cannot occur if the point is habitually placed as here recommended.

§ 2. Rows of figures consisting of a large number should be set down in triplets, (groups of three figures each,) starting from the Decimal point either way, (right and left.) The space between the triplets to be one-half more than the space between the three figures; and the space between the Integer unit and the Dime, double said space between the figures and each triplet: thus, 1 236 742 598 ·103 296 310 462 3, &c.

§ 3. In additions or multiplications requiring more than three or four rows of figures, there is generally a saving of time, and a lessening of the strain on the attention, and of the risk of error, by first ruling, at the proper distances from each other, perpendicular lines for the respective columns of figures, *and for the Decimal Points in particular.* This careful setting down of figures, whose place is the same in value, one precisely under the other, units under units, tens under tens, &c., is taught in all Books of Arithmetic, but very much disregarded in practice. The writer, after a long experience, can with confidence assert that a hasty and careless setting down of figures makes slow correct computations.

§ 4. Before commencing any long multiplication the figures composing the two factors should be compared, so as to ascertain which of them will be the most convenient multiplier. The one admitting of the readiest subdivision into easy factors, or having most zeros and repetitions of the same figures, would, of course, be always preferred. In Examples 8 and 9, amongst those illustrative of Foreign Exchanges, it will be at once seen that 1 505 ·947 in No. 9, is a more convenient multiplier than 4 ·347 826 in No. 8; as, besides having a repetition of two figures, like the latter, it has the advantage over it in having a zero and commencing with a 1.

§ 5. The number of fractional figures required in the sum of an addition or the product of a multiplication should be attended to, in order that no more figures be used than are strictly necessary to bring out an accurate result to a given number of figures. Thus, if in exchanges of Pounds Imperial into Dollars, only two decimal figures are wanted exact, that is, the accurate number of cents, the two last columns of figures, and, of course, the last multiplier and its product, are useless in Example 8, as also the last column in Example 9. The true amount of cents (·42) would, in both instances, be brought out independently of them.

§ 6. To avoid the unnecessary use of zeros and valid figures, it is advisable to set down the multiplier in a column at right angles to the line of the multiplicand, at three or four figures' space distant from the first product; and to denote in the fractional portion the place of each decimal figure by the system of notation used in the following examples, ticking off the respective figures, both in the multiplier and multiplicand, as soon as the corresponding product is set down.

EXAMPLE 1.

```
Multiply   1   505·947   916   666~
    by             4·347   826   086 95
           ----------------------------
           1   505·947   916   666~
           ----------------------------
 4·          023   7:91   666   666~
  ·3✓        451   7:86   374   999
  :4✓         60   2:37   916   666~
 .·.7✓        10   5:41   635   415
 ::8           1   2:04   758   333~
           ..........:
:5:2                 30   118   958
:6:6✓                 9   035   687
:8:08✓                    120   476
:9: 6✓                      9   035
:10: 9✓                     1   354
:11: 5✓                          75
           ----------------------------
           6   547·599   637   665
```

EXAMPLE 2.

```
Multiply      4·347   826   086   95
    by     1505·947   916   666 ~
           ----------------------------
 1            4·347   8:26  086   95
✓5          2 173     9:13  043   475
✓05·           21     7:39  130   434
   ·9✓          3     9:13  043   477
   :4✓                1:73  913   043
           ............:
  .·.7✓                 30  434   782
  ::9✓                   3  913   043
:5:1✓                        43   478
:6:6✓                        26   086
:7:6✓                         2   608
:8:6✓                             261
:9:6✓                              26
           ----------------------------
            6 547     ·599  637   663
```

Nothing like this would ever be required in any monetary computations; the figures enclosed in the dotted lines being all that is necessary in the exchange of Pounds into Dollars to obtain the exact equivalent as far as cents, (hundredths of the Dollar.) But as these hints are not limited to monetary calculations only, but to the management of Decimals in general, these Examples may be of service to mathematical students in various other kinds of computations. The number within the four dots, before the bottom figure of the multiplier, indicates its place from the Decimal Point, and serves the same purpose as Triplets do in a horizontal line. The Examples themselves form one same computation (with an alteration in the position of the factors) of the percentage of exchange from Pounds Imperial into Dollars, at the rate of 46 pence per dollar carried to nine fractional figures in the product, being true to the eighth figure, inclusive; and on removing the point two figures to the left, for the division by 100, the percentage is perfectly correct to the tenth figure, inclusive, and would be set down thus—

65·475 996 376 6~

Four of these fractional figures, as herebefore shown, are sufficient to bring out the exact equivalent as far as cents of a dollar, thus—

Par equivalent of the Imperial amount	$ 1505·947 9
Percentage corresponding to 46d.	65·475 9
Exact equivalent in Dollars and Cents	$ 1571·42

See Examples 6 and 10 in those illustrative of Exchanges.

If Mils of Dollars were required, the above would become $ 1 571 ·424, being only in excess by the minute fraction $\frac{87}{1000000}$, (Eighty-seven Millionths.)

§ 7. All final zeros in Decimal Fractions should be omitted in setting down either sums or products.

EXAMPLE IN ADDITION.

```
 4 ·247–
 1 ·611
 6 ·452–
 5 ·513
 2 ·176
 -------
20 ·
```

EXAMPLE IN MULTIPLICATION.

```
   12 ·687 5
×          4
   ---------
   50 ·75
×        2
   ------
  101 ·5
```

§ 8. When a decimal fraction is infinite, either by the repetition of a single figure, or by the recurrence of two or more figures constituting a circulating decimal, a convenient symbol to denote its infinity is ∾ after the repeating or last recurring figure, as ·33∾, ·66∾, ·99∾; and for circulating decimals, to place a dot over the first recurring figure, as ·0̇9∾, ·7̇29∾, ·6̇75 324∾, ·2̇85 714∾. In the conversion of pence and farthings into Imperial money, or in computations by the Imperial equivalents of pence and farthings, the only infinite fractions an accountant would have to deal with are ·33∾, ·66∾, ·99∾; and these are rendered finite wherever the computation has to be closed, by changing the first and second into the vulgar fractions ⅓, ⅔, and the last into a unit; as shown in the following examples:—

$$\begin{array}{r@{\;}l c r@{\;}l}
4 & \cdot833\backsim & = & 4 & \cdot8\tfrac{1}{3} \\
9 & \cdot166\backsim & = & 9 & \cdot1\tfrac{2}{3} \\
5 & \cdot999\backsim & = & 6 & \cdot \\
\hline
19 & \cdot999\backsim & = & 20 & . \\
\hline\hline
\end{array}$$

TABLE I.

Exact Decimal Equivalents of the several Subdivisions of Forty Shillings Sterling.

Shillings.	Pence.			Imperial.											Sterling.									
				£	D.	C.	M.	DM.							£	F.	C.	M.	DM.					
...	...	⅛	=	...	·0	0	0	2	6	0	4	1	⅔	=	...	·0	0	0	5	2	0	8	⅓	...
...	...	¼	=	...	·0	0	0	5	2	0	8	⅓	...	=	...	·0	0	1	0	4	1	⅔	...	...
...	...	½	=	...	·0	0	1	0	4	1	⅔	...	...	=	...	·0	0	2	0	8	⅓	...	...	...
...	...	¾	=	...	·0	0	1	5	⅝	...	...	...	...	=	...	·0	0	3	1	¼	...	...	...	...
...	1	...	=	...	·0	0	2	0	8	⅓	...	...	...	=	...	·0	0	4	1	⅔	...	...	...	...
...	2	...	=	...	·0	0	4	1	⅔	...	...	...	...	=	...	·0	0	8	⅓	...	...	...	...	...
...	3	...	=	...	·0	0⅝	...	...	...	...	...	...	...	=	...	·0⅛	...	...	...	...	...	...	...	...
...	4	...	=	...	·0	0	8⅓	...	...	...	...	...	...	=	...	·0	1⅔	...	...	...	...	...	...	...
...	5	...	=	...	·0	1	0	4	1⅔	...	...	...	...	=	...	·0	2	0	8⅓	...	...	...	...	...
...	6	...	=	...	·0⅛	...	...	...	...	...	...	...	...	=	...	·0¼	...	...	...	...	...	...	...	...
...	7	...	=	...	·0	1	4	5	8⅓	...	...	...	...	=	...	·0	2	9	1⅔	...	...	...	...	...
...	8	...	=	...	·0	1⅔	...	...	...	...	...	...	...	=	...	·0	3⅓	...	...	...	...	...	...	...
...	9	...	=	...	·0	1⅞	...	...	...	...	...	...	...	=	...	·0	3¾	...	...	...	...	...	...	...
...	10	...	=	...	·0	2	0	8⅓	...	...	...	...	...	=	...	·0	4	1⅔	...	...	...	...	...	...
...	11	...	=	...	·0	2	2	9	1	⅔	...	...	...	=	...	·0	4	5	8	⅓	...	...	...	...
1	...	...	=	...	·0	2	5	...	...	...	...	...	...	=	...	·0	5	...	...	...	...	...	...	...
2	...	...	=	...	·0	5	...	...	...	...	...	...	...	=	...	·1	...	...	...	...	...	...	...	...
3	...	...	=	...	·0	7	5	...	...	...	...	...	...	=	...	·1	5	...	...	...	...	...	...	...
4	...	...	=	...	**·1**	...	...	...	...	...	...	...	...	=	...	**·2**	...	...	...	...	...	...	...	...
5	...	...	=	...	·1	2	5	...	...	...	...	...	...	=	...	·2	5	...	...	...	...	...	...	...
6	...	...	=	...	·1	5	...	...	...	...	...	...	...	=	...	**·3**	...	...	...	...	...	...	...	...
7	...	...	=	...	·1	7	5	...	...	...	...	...	...	=	...	·3	5	...	...	...	...	...	...	...
8	...	...	=	...	**·2**	...	...	...	...	...	...	...	...	=	...	**·4**	...	...	...	...	...	...	...	...
9	...	...	=	...	·2	2	5	...	...	...	...	...	...	=	...	·4	5	...	...	...	...	...	...	...
10	...	...	=	...	·2	5	...	...	...	...	...	...	...	=	...	**·5**	...	...	...	...	...	...	...	...
11	...	...	=	...	·2	7	5	...	...	...	...	...	...	=	...	·5	5	...	...	...	...	...	...	...
12	...	...	=	...	**·3**	...	...	...	...	...	...	...	...	=	...	**·6**	...	...	...	...	...	...	...	...
13	...	...	=	...	·3	2	5	...	...	...	...	...	...	=	...	·6	5	...	...	...	...	...	...	...
14	...	...	=	...	·3	5	...	...	...	...	...	...	...	=	...	**·7**	...	...	...	...	...	...	...	...
15	...	...	=	...	·3	7	5	...	...	...	...	...	...	=	...	·7	5	...	...	...	...	...	...	...
16	...	...	=	...	**·4**	...	...	...	...	...	...	...	...	=	...	**·8**	...	...	...	...	...	...	...	...
17	...	...	=	...	·4	2	5	...	...	...	...	...	...	=	...	·8	5	...	...	...	...	...	...	...
18	...	...	=	...	·4	5	...	...	...	...	...	...	...	=	...	**·9**	...	...	...	...	...	...	...	...
19	...	...	=	...	·4	7	5	...	...	...	...	...	...	=	...	·9	5	...	...	...	...	...	...	...
20	...	...	=	...	**·5**	...	...	...	...	...	...	...	...	=	**1**	...	...	...	...	...	...	...	...	...
21	...	...	=	...	·5	2	5	...	...	...	...	...	...	=	1	·0	5	...	...	...	...	...	...	...
22	...	...	=	...	·5	5	...	...	...	...	...	...	...	=	1	**·1**	...	...	...	...	...	...	...	...
23	...	...	=	...	·5	7	5	...	...	...	...	...	...	=	1	·1	5	...	...	...	...	...	...	...
24	...	...	=	...	**·6**	...	...	...	...	...	...	...	...	=	1	**·2**	...	...	...	...	...	...	...	...
25	...	...	=	...	·6	2	5	...	...	...	...	...	...	=	1	·2	5	...	...	...	...	...	...	...
26	...	...	=	...	·6	5	...	...	...	...	...	...	...	=	1	**·3**	...	...	...	...	...	...	...	...
27	...	...	=	...	·6	7	5	...	...	...	...	...	...	=	1	·3	5	...	...	...	...	...	...	...
28	...	...	=	...	**·7**	...	...	...	...	...	...	...	...	=	1	**·4**	...	...	...	...	...	...	...	...
29	...	...	=	...	·7	2	5	...	...	...	...	...	...	=	1	·4	5	...	...	...	...	...	...	...
30	...	...	=	...	·7	5	...	...	...	...	...	...	...	=	1	**·5**	...	...	...	...	...	...	...	...
31	...	...	=	...	·7	7	5	...	...	...	...	...	...	=	1	·5	5	...	...	...	...	...	...	...
32	...	...	=	...	**·8**	...	...	...	...	...	...	...	...	=	1	**·6**	...	...	...	...	...	...	...	...
33	...	...	=	...	·8	2	5	...	...	...	...	...	...	=	1	·6	5	...	...	...	...	...	...	...
34	...	...	=	...	·8	5	...	...	...	...	...	...	...	=	1	**·7**	...	...	...	...	...	...	...	...
35	...	...	=	...	·8	7	5	...	...	...	...	...	...	=	1	·7	5	...	...	...	...	...	...	...
36	...	...	=	...	**·9**	...	...	...	...	...	...	...	...	=	1	**·8**	...	...	...	...	...	...	...	...
37	...	...	=	...	·9	2	5	...	...	...	...	...	...	=	1	·8	5	...	...	...	...	...	...	...
38	...	...	=	...	·9	5	...	...	...	...	...	...	...	=	1	**·9**	...	...	...	...	...	...	...	...
39	...	...	=	...	·9	7	5	...	...	...	...	...	...	=	1	·9	5	...	...	...	...	...	...	...
40	...	...	=	**1**	·...	...	...	...	...	...	...	...	...	=	**2**	...	...	...	...	...	...	...	...	...

Note.—In Table II. the short line (–) stands for 5, and is called the Half-Mil Line. This (∾) is the symbol of Infinity. But ·33 ∾ = ⅓ : ·66 ∾ = ⅔ : and ·99 ∾ = 1.

TABLE II.—DECIMAL EQUIVALENTS

From Half a Farthing, by successive Farthings, to Two Shillings for

£0, 0s. 0⅛d. to £0, 1s. 0d.

S.	P.	F.	Imperial. T.	Pence.	F.	Imperial. C.	Sterling. T.	Sterling. C.
...	...	⅛	·000	...	⅛	·000 260 416~	·000–	·000 520 833~
...	...	¼	·000–	...	¼	·000 520 833~	·001	·001 041 666~
...	...	½	·001	...	½	·001 041 666~	·002	·002 083 333~
...	...	¾	·001–	...	¾	·001 562 5	·003	·003 125
...	1	...	·002	1	...	·002 083 333~	·004	·004 166 666~
...	...	¼	·002–	...	¼	·002 604 166~	·005	·005 208 333~
...	...	½	·003	...	½	·003 125	·006–	·006 25
...	...	¾	·003–	...	¾	·003 645 833~	·007	·007 291 666~
...	2	...	·004	2	...	·004 166 666~	·008–	·008 333 333~
...	...	¼	·004–	...	¼	·004 687 5	·009	·009 375
...	...	½	·005	...	½	·005 208 333~	·010–	·010 416 666~
...	...	¾	·005–	...	¾	·005 729 166~	·011–	·011 458 333~
...	3	...	·006	3	...	·006 25	·012–	·012 5
...	...	¼	·007	...	¼	·006 770 833~	·013–	·013 541 666~
...	...	½	·007–	...	½	·007 291 666~	·014–	·014 583 333~
...	...	¾	·008	...	¾	·007 812 5	·015–	·015 625
...	4	...	·008–	4	...	·008 333 333~	·016–	·016 666 666~
...	...	¼	·009	...	¼	·008 854 166~	·017–	·017 708 333~
...	...	½	·009–	...	½	·009 375	·019	·018 75
...	...	¾	·010	...	¾	·009 895 833~	·020	·019 791 666~
...	5	...	·010–	5	...	·010 416 666~	·021	·020 833 333~
...	...	¼	·011	...	¼	·010 937 5	·022	·021 875
...	...	½	·011–	...	½	·011 458 333~	·023	·022 916 666~
...	...	¾	·012	...	¾	·011 979 166~	·024	·023 958 333~
...	6	...	·012–	6	...	·012 5	·025	·025
...	...	¼	·013	...	¼	·013 020 833~	·026	·026 041 666~
...	...	½	·013–	...	½	·013 541 666~	·027	·027 083 333~
...	...	¾	·014	...	¾	·014 062 5	·028	·028 125
...	7	...	·014–	7	...	·014 583 333~	·029	·029 166 666~
...	...	¼	·015	...	¼	·015 104 166~	·030	·030 208 333~
...	...	½	·015–	...	½	·015 625	·031	·031 25
...	...	¾	·016	...	¾	·016 145 833~	·032	·032 291 666~
...	8	...	·016–	8	...	·016 666 666~	·033–	·033 333 333~
...	...	¼	·017	...	¼	·017 187 5	·034–	·034 375
...	...	½	·018	...	½	·017 708 333~	·035–	035 416 666~
...	...	¾	·018–	...	¾	·018 229 166~	·036–	·036 458 333~
...	9	...	·019	9	...	·018 75	·037–	·037 5
...	...	¼	·019–	...	¼	·019 270 833~	·038–	·038 541 666~
...	...	½	·020	...	½	·019 791 666~	·039–	·039 583 333~
...	...	¾	·020–	...	¾	·020 312 5	·040–	·040 625
...	10	...	·021	10	...	·020 833 333~	·041–	·041 666 666~
...	...	¼	·021–	...	¼	·021 354 166~	·042–	042 708 333~
...	...	½	·022	...	½	·021 875	·044	·043 75
...	...	¾	·022–	...	¾	·022 395 833~	·045	·044 791 666~
...	11	...	·023	11	...	·022 916 666~	·046	·045 833 333~
...	...	¼	·023–	...	¼	·023 437 5	·047	·046 875
...	...	½	·024	...	½	·023 958 333~	·048	·047 916 666~
...	...	¾	·024–	...	¾	·024 479 166~	·049	·048 958 333~
1	...	...	·025	12	...	·025	·05	·05

£0, 1s. 0d. to

S.	P.	F.	Imperial. T.	Pence.	F.	Imperial. C.
1	...	...	·025	12	...	·025
...	...	¼	·025–	...	¼	·025 520 833~
...	...	½	·026	...	½	·026 041 666~
...	...	¾	·026–	...	¾	·026 562 5
1	1	...	·027	13	...	·027 083 333~
...	...	¼	·027–	...	¼	·027 604 166~
...	...	½	·028	...	½	·028 125
...	...	¾	·028–	...	¾	·028 645 833~
1	2	...	·029	14	...	·029 166 666~
...	...	¼	·029–	...	¼	·029 687 5
...	...	½	·030	...	½	·030 208 333~
...	...	¾	·030–	...	¾	·030 729 166~
1	3	...	·031	15	...	·031 25
...	...	¼	·032	...	¼	·031 770 833~
...	...	½	·032–	...	½	·032 291 666~
...	...	¾	·033	...	¾	·032 812 5
1	4	...	·033–	16	...	·033 333 333~
...	...	¼	·034	...	¼	·033 854 166~
...	...	½	·034–	...	½	·034 375
...	...	¾	·035	...	¾	·034 895 833~
1	5	...	·035–	17	...	·035 416 666~
...	...	¼	·036	...	¼	·035 937 5
...	...	½	·036–	...	½	·036 458 333~
...	...	¾	·037	...	¾	·036 979 166~
1	6	...	·037–	18	...	·037 5
...	...	¼	·038	...	¼	·038 020 833~
...	...	½	·038–	...	½	·038 541 666~
...	...	¾	·039	...	¾	·039 062 5
1	7	...	·039–	19	...	·039 583 333~
...	...	¼	·040	...	¼	·040 104 166~
...	...	½	·040–	...	½	·040 625
...	...	¾	·041	...	¾	·041 145 833~
1	8	...	·041–	20	...	·041 666 666~
...	...	¼	·042	...	¼	·042 187 5
...	...	½	·043	...	½	·042 708 333~
...	...	¾	·043–	...	¾	·043 229 166~
1	9	...	·044	21	...	·043 75
...	...	¼	·044–	...	¼	·044 270 833~
...	...	½	·045	...	½	·044 791 666~
...	...	¾	·045–	...	¾	·045 312 5
1	10	...	·046	22	...	·045 833 333~
...	...	¼	·046–	...	¼	·046 354 166~
...	...	½	·047	...	½	·046 875
...	...	¾	·047–	...	¾	·047 395 833~
1	11	...	·048	23	...	·047 916 666~
...	...	¼	·048–	...	¼	·048 437 5
...	...	½	·049	...	½	·048 958 333~
...	...	¾	·049–	...	¾	·049 479 166~
2	...	...	·05	24	...	·05

OF STERLING VULGAR FRACTIONS,

Sterling Equivalents, and to Four Shillings for Imperial Equivalents.

£0, 2s. 0d.				£0, 2s. 0d. to £0, 3s. 0d.									£0, 3s. 0d. to £0, 4s. 0d.								
Sterling.							Imperial Equivalents.									Imperial Equivalents.					
T.	C.			S.	P.	F.	T.	P.	F.	C.			S.	P.	F.	T.	P.	F.	C.		
·05	·05			2	...	...	·05	24	...	·05			3	...	...	·075	36	...	·075		
·051	·051	041	666~	...	...	¼	·050–	...	¼	·050	520	833~	...	...	¼	·075–	...	¼	·075	520	833~
·052	·052	083	333~	...	...	½	·051	...	½	·051	041	666~	...	...	½	·076	...	½	·076	041	666~
·053	·053	125		...	...	¾	·051–	...	¾	·051	562	5	...	...	¾	·076–	...	¾	·076	562	5
·054	·054	166	666~	2	1	...	·052	25	...	·052	083	333~	3	1	...	·077	37	...	·077	083	333~
·055	·055	208	333~	...	...	¼	·052–	...	¼	·052	604	116~	...	...	¼	·077–	...	¼	·077	604	166~
·056–	·056	25		...	...	½	·053	...	½	·053	125		...	...	½	·078	...	½	·078	125	
·057	·057	291	666~	...	...	¾	·053–	...	¾	·053	645	833~	...	...	¾	·078–	...	¾	·078	645	833~
·058	·058	333	333~	2	2	...	·054	26	...	·054	166	666~	3	2	...	·079	38	...	·079	166	666~
·059	·059	375		...	...	¼	·054–	...	¼	·054	687	5	...	...	¼	·079–	...	¼	·079	687	5
·060–	·060	416	666~	...	...	½	·055	...	½	·055	208	333~	...	...	½	·080	...	½	·080	208	333~
·061–	·061	458	333~	...	...	¾	·055–	...	¾	·055	729	166~	...	...	¾	·080–	...	¾	·080	729	166~
·062–	·062	5		2	3	...	·056	27	...	·056	25		3	3	...	·081	39	...	·081	25	
·063–	·063	541	666~	...	...	¼	·057	...	¼	·056	770	833~	...	...	¼	·082	...	¼	·081	770	833~
·064–	·064	583	333~	...	...	½	·057–	...	½	·057	291	666~	...	...	½	·082–	...	½	·082	291	666~
·065–	·065	625		...	...	¾	·058	...	¾	·057	812	5	...	...	¾	·083	...	¾	·082	812	5
·066–	·066	666	666~	2	4	...	·058–	28	...	·058	333	333~	3	4	...	·083–	40	...	·083	333	333~
·067–	·067	708	333~	...	...	¼	·059	...	¼	·058	854	166~	...	...	¼	·084	...	¼	·083	854	166~
·069	·068	75		...	...	½	·059–	...	½	·059	375		...	...	½	·084–	...	½	·084	375	
·070	·069	791	666~	...	...	¾	·060	...	¾	·059	895	833~	...	...	¾	·085	...	¾	·084	895	833~
·071	·070	833	333~	2	5	...	·060–	29	...	·060	416	666~	3	5	...	·085–	41	...	·085	416	666~
·072	·071	875		...	...	¼	·061	...	¼	·060	937	5	...	...	¼	·086	...	¼	·085	937	5
·073	·072	916	666~	...	...	½	·061–	...	½	·061	458	333~	...	...	½	·086–	...	½	·086	458	333~
·074	·073	958	333~	...	...	¾	·062	...	¾	·061	979	166~	...	...	¾	·087	...	¾	·086	979	166~
·075	·075			2	6	...	·062–	30	...	·062	5		3	6	...	·087–	42	...	·087	5	
·076	·076	041	666~	...	...	¼	·063	...	¼	·063	020	833~	...	...	¼	·088	...	¼	·088	020	833~
·077	·077	083	333~	...	...	½	·063–	...	½	·063	541	666~	...	...	½	·088–	...	½	·088	541	666~
·078	·078	125		...	...	¾	·064	...	¾	·064	062	5	...	...	¾	·089	...	¾	·089	062	5
·079	·079	166	666~	2	7	...	·064–	31	...	·064	583	333~	3	7	...	·089–	43	...	·089	583	333~
·080	·080	208	333~	...	...	¼	·065	...	¼	·065	104	166~	...	...	¼	·090	...	¼	·090	104	166~
·081	·081	25		.	...	½	·065–	...	½	·065	625		...	...	½	·090–	...	½	·090	625	
·082	·082	291	666~	...	...	¾	·066	...	¾	·066	145	833~	...	...	¾	·091	...	¾	·091	145	833~
·083–	·083	333	333~	2	8	...	·066–	32	...	·066	666	666~	3	8	...	·091–	44	...	·091	666	666~
·084–	·084	375		...	...	¼	·067	...	¼	·067	187	5	...	...	¼	·092	...	¼	·092	187	5
·085–	·085	416	666~	...	...	½	·068	...	½	·067	708	333~	...	...	½	·093	...	½	·092	708	333~
·086–	·086	458	333~	...	...	¾	·068–	...	¾	·068	229	166~	...	...	¾	·093–	...	¾	·093	229	166~
·087–	·087	5		2	9	...	·069	33	...	·068	75		3	9	...	·094	45	...	·093	75	
·088–	·088	541	666~	...	...	¼	·069–	...	¼	·069	270	833~	...	...	¼	·094–	...	¼	·094	270	833~
·089–	·089	583	333~	...	...	½	·070	...	½	·069	791	666~	...	...	½	·095	...	½	·094	791	666~
·090–	·090	625		...	...	¾	·070–	...	¾	·070	312	5	...	...	¾	·095–	...	¾	·095	312	5
·091–	·091	666	666~	2	10	...	·071	34	...	·070	833	333~	3	10	...	·096	46	...	·095	833	333~
·092–	·092	708	333~	...	...	¼	·071–	...	¼	·071	354	166~	...	...	¼	·096–	...	¼	·096	354	166~
·094	·093	75		...	...	½	·072	...	½	·071	875		...	...	½	·097	..	½	·096	875	
·095	·094	791	666~	...	...	¾	·072–	..	¾	·072	395	833~	...	...	¾	·097–	...	¾	·097	395	833~
·096	·095	833	333~	2	11	...	·073	35	...	·072	916	666~	3	11	...	·098	47	...	·097	916	666~
·097	·096	875		...	...	¼	·073–	...	¼	·073	437	5	...	...	¼	·098–	...	¼	·098	437	5
·098	·097	916	666~	...	...	½	·074	...	½	·073	958	333~	...	...	½	·099	...	½	·098	958	333~
·099	·098	958	333~	...	...	¾	·074–	...	¾	·074	479	166~	...	...	¾	·099–	...	¾	·099	479	166~
·1	·1			3	...	...	·075	36	...	·075			4	...	...	·1	48	...	·1		

TABLES III. IV. & V.—PERCENTAGES FOR THE

TABLES OF DECIMAL EQUIVALENTS. In Percentage Rates, for Pence Rates in Exchanges between Pounds and Dollars.			TABLES OF DECIMAL EQUIVALENTS. In Percentage Rates, for Pence Rates in Exchanges between Pounds and Dollars.		
TABLE III.	(36d. to 48d.)	TABLE IV.	TABLE III. *continued.*	48d. to 60d.	TABLE IV. *contd.*
For Pounds into Dollars. Percentage Rates.	Pence Rates.	Dollars into Pounds. Percentage Rates.	For Pounds into Dollars. Percentage Rates.	Pence Rates.	Dollars into Pounds. Percentage Rates.
33· 333 333 333 3~	36	25·	PAR.	48	PAR.
32· 413 793 103 4	¼	24· 479 166~	· 518 134 715 0	¼	· 520 333~
31· 506 849 315 0	½	23· 958 333~	1· 030 927 835 0–	½	1· 041 666~
30· 612 244 897 9–	¾	23· 437 5	1· 538 461 538 4~	¾	1· 562 5
29· 729 729 729 7~	37	22· 916 666~	2· 040 816 326 5	49	2· 083 333~
28· 859 060 402 6–	¼	22· 395 833~	2· 538 071 065 9–	¼	2· 604 166~
28·	½	21· 875	3· 030 303 030 3~	½	3· 125
27· 152 317 880 7–	¾	21· 354 166~	3· 517 587 939 7	¾	3· 645 833~
26· 315 789 473 6–	38	20· 833 333~	4·	50	4· 166 666~
25· 490 196 078 4	¼	20· 312 5	4· 477 611 940 2–	¼	4· 687 5
24· 675 324 675 3~	½	19· 791 666~	4· 950 495 049 5~	½	5· 208 333~
23· 870 967 741 9	¾	19· 270 833~	5· 418 719 211 8	¾	5· 729 166~
23· 076 923 076 9~	39	18· 75	5· 882 352 941 1–	51	6· 25
22· 292 993 630 5	¼	18· 229 156~	6· 341 463 414 6~	¼	6· 770 833~
21· 518 987 341 7–	½	17· 708 333~	6· 796 116 504 8–	½	7· 291 666~
20· 754 716 981 1	¾	17· 187 5	7· 246 376 811 5–	¾	7· 812 5
20·	40	16· 666 666~	7· 692 307 692 3~	52	8· 333 333~
19· 254 658 385 0–	¼	16· 145 833~	8· 133 971 291 8–	¼	8· 854 166~
18· 518 518 518 5~	½	15· 625	8· 571 428 571 4	½	9· 375
17· 791 411 042 9	¾	15· 104 166~	9· 004 739 336 4–	¾	9· 895 833~
17· 073 170 731 7~	41	14· 583 333~	9· 433 962 264 1–	53	10· 416 666~
16· 363 636 363 6~	¼	14· 062 5	9· 859 150 234 7	¼	10· 937 5
15· 662 650 602 4	½	13· 541 666~	10· 280 373 831 7–	½	11· 458 333~
14· 970 059 880 2	¾	13· 020 833~	10· 697 674 418 6	¾	11· 979 166~
14· 285 714 285 7~	42	12· 5	11· 111 111 111 1~	54	12· 5
13· 609 467 455 6	¼	11· 979 166~	11· 520 737 327 3	¼	13· 020 833~
12· 941 176 470 5–	½	11· 458 333~	11· 926 611 109 1–	½	13· 541 666~
12· 280 701 754 3	¾	10· 937 5	12· 328 766 666 6~	¾	14· 062 5
11· 627 906 976 7	43	10· 416 666~	12· 727 272 727 2~	55	14· 583 333~
10· 982 658 959 5	¼	9· 895 833~	13· 122 171 945 7	¼	15· 104 166~
10· 344 827 586 2	½	9· 375	13· 513 513 513 5~	½	15· 625
9· 714 285 714 2–	¾	8· 854 166~	13· 901 345 291 0	¾	16· 145 833~
9· 090 909 090 9~	44	8· 333 333~	14· 285 714 285 7	56	16· 666 666~
8· 474 576 271 1–	¼	7· 812 5	14· 666 666 666 6~	¼	17· 187 5
7· 865 168 539 3	½	7· 291 666~	15· 044 247 787 6	½	17· 708 333~
7· 262 569 832 4	¾	6· 770 833~	15· 418 502 203 6	¾	18· 229 166~
6· 666 666 666 6~	45	6· 25	15· 789 473 684 2	57	18· 75
6· 077 348 066 2–	¼	5· 729 166~	16· 157 205 240 1–	¼	19· 270 833~
5· 494 505 494 5~	½	5· 208 333~	16· 521 739 130 4	½	19· 791 666~
4· 918 032 240 4	¾	4· 687 5	16· 883 116 883 1~	¾	20· 312 5
4· 347 826 086 9–	46	4· 166 166~	17· 241 379 310 3	58	20· 833 333~
3· 783 783 783 7~	¼	3· 645 833~	17· 596 566 523 6	¼	21· 354 166~
3· 225 806 451 6~	½	3· 125	17· 948 717 948 7~	½	21· 875
2· 673 796 844 9	¾	2· 604 166~	18· 297 872 340 4	¾	22· 395 833~
2· 127 659 744 6–	47	2· 083 333~	18· 644 067 796 6	59	22· 916 666~
1· 587 305 870 8–	¼	1· 562 5	18· 987 341 772 1	¼	23· 437 5
1· 052 631 578 9	½	1· 041 666~	19· 327 731 092 1	½	23· 958 333~
· 523 560 020 9	¾	· 520 833~	19· 665 271 962 3	¾	24· 479 166~
PAR.	48	PAR.	20·	60	25·

EXCHANGE BETWEEN POUNDS AND DOLLARS.

TABLE V.

For Exchanges of Dollars into Pounds.

Pence.				Percentage.	Pence.				Percentage.	Pence.				Percentage.
P	F	P	F		P	F	P	F		P	F	P	F	
36		60		25·=¼th	40		56		16·⅔	44		52		8·⅓
	¼		¾	24·4791⅔		¼		¾	16·1458⅓		¼		¾	7·8⅛
	½		½	23·958⅓		½		½	15·⅝		½		½	7·291⅔
	¾		¼	23·4⅜		¾		¼	15·104⅔		¾		¼	6·7708⅓
37		59		22·91⅔	41		55		14·58⅓	45		51		6·¼
	¼		¾	22·3958⅓		¼		¾	14·06¼		¼		¾	5·7291⅔
	½		½	21·⅞		½		½	13·541⅔		½		½	5·208⅓
	¾		¼	21·3541⅔		¾		¼	13·0208⅓		¾		¼	4·6⅞
38		58		20·8⅓	42		54		12·5=⅛th	46		50		4·1⅔
	¼		¾	20·3⅛		¼		¾	11·9791⅔		¼		¾	3·6458⅓
	½		½	19·791⅔		½		½	11·458⅓		½		½	3·⅛
	¾		¼	19·2708⅓		¾		¼	10·9⅜		¾		¼	2·6041⅔
39		57		18·¾	43		53		10·41⅔	47		49		2·08⅓
	¼		¾	18·2291⅔		¼		¾	9·8958⅓		¼		¾	1·5⅝
	½		½	17·708⅓		½		½	9·⅜		½		½	1·041⅔
	¾		¼	17·⅞		¾		¼	8·8541⅔		¾		¼	·5203⅓
40		56		16·⅔	44		52		8·⅓	48		48		PAR.

Note.—From 36d. to 48d. (PAR) inspect downwards; and from 48d. to 60d. inspect upwards.

EXAMPLES OF THE APPLICATION OF TABLES III., IV., AND V.

Ex. 1. Exchange 1200000 (Twelve Hundred Thousand Pounds) Sterling into Dollars @ 44¼d. per Dollar.

TABLE 3. 44¼ = percentage = 8·474 576 2
PAR of £ = $6 000 000 ∠× 6
508 474·57
Add par amount, 6 000 000
Ans. = $ 6 508 474·57

Ex. 2. Exchange 6 508 474· Dollars 57 Cents into Pounds Sterling @ 44¼d. per Dollar.

Percentage of 44¼ (TABLE 5) 7·8⅓ } PAR £ imp. = 650 847·457
∠ × $\frac{7}{100}$ = 455 59·322
∠ × ·8 = 52 06·779
∠ ÷ :⅛ = 81·355
∠..............50 847·457
£1 200 000 = £600 000

Ex. 3. Exchange £193 17s. 11¾d. into Dollars at 45d. per Dollar.—Percentage (TABLE 3) 6·66∾ = ⅔

£193 17s. 11¾d. (TABLE 2, T) at PAR = $ 969·495
⅓ = $\frac{33}{100}$ ∠ ÷ $\frac{3}{100}$ = 32·316
⅓ = repeat = 32·316
Ans. . = $1034·127

Ex. 4. Exchange $1034·127 into Pounds Sterling @ 45 pence per Dollar.

TABLE 5. 45d. = 6¼. PAR £103·4127
∠ × $\frac{6}{100}$ 6·20476
∠ ÷ ·4 ·25853
∠ 6·4632
£96·9 = £193 : 16 £96·949–
(TABLE 2, T) ·049– 1 : 11¾
Ans. = £193 : 17 : 11¾

Ex. 5. Exchange £1256 13s. 10½d. into Dollars @ 46½d. per Dollar.—Percentage (TABLE 3) 3·2258

£1256 13s. 10½d. (TABLE 2, C) = PAR $6283·46875
∠ × $\frac{3}{100}$ 188·50406
∠ × ·2 12·56693
:2 1·25669
.·.5 ·31417
::8 ·05026
Ans. = $6486·16

Ex. 6. Exchange $6486·16 into Pounds Sterling @ 46½d. per Dollar.

Percentage (TABLE 5) 3·⅛ PAR = £648·616
∠ $\frac{3}{100}$ = 19·45848
∠ ÷ $\frac{8}{1000}$ = ·81077
∠ 20·2692
£628·3 = £1256 12s. 0d. £628·3468
(TABLE 2, T) ·047 = 1s. 10½d.
Ans. £1256 13s. 10½d.

Ex. 7. Exchange £1161 17s. 11¼d. into Dollars @ 4s. 7½d. (55½d.) per Dollar.

Percentage (TABLE 3.)
13·5135 £1161 16s. PAR = $5809·
(TABLE 2, T) 1s. 11¼ = 0·484375
$\frac{10}{100}$· = 580·9484 $5809·484
3· = 174·2845
·5 = 29·0474
:1 = ·5809
.·.3 = ·1742
: :5 = ·0290
:5:1 = ·0005
∠..............................785·066
Ans. $5024·419

Ex. 8. Exchange $5024·41 into Pounds Sterling at 4s. 7½d. (55½d.) per Dollar.

Percentage (TABLE 5) 15⅝ PAR = £502·4419.
10· ∠ ÷ 10 = 50·24419
5· ∠÷ 2 = 25·12207
·$\frac{4}{8}$ ∠÷ 10 = 2·51220
·⅛ ∠÷ 4 = ·62805
£580·9 = 1161 : 16 £580·948–
(TABLE 2, F) ·048 = 1 : 11¼
Ans. £1161 : 17 : 11¼

TABLE VI.

Days.	Decimal Fractions of 1 year (= 365 days.)	Days.	Decimal Fractions of 1 year (= 365 days.)
1	·002 739 726	43	·117 808 219
2	·005 479 452	44	·120 547 945
3	·008 219 178	45	·123 287 671
4	·010 958 904	46	·126 027 397
5	·013 698 630	47	·128 767 123
6	·016 438 356	48	·131 506 849
7	·019 178 082	**49**	·134 246 575
8	·021 917 808	50	·136 986 301
9	·024 657 534	51	·139 726 027
10	·027 397 260	52	·142 465 753
11	·030 136 986	53	·145 205 479
12	·032 876 712	54	·147 945 205
13	·035 616 438	55	·150 684 931
14	·038 356 164	**56**	·153 424 657–
15	·041 095 890	57	·156 164 383–
16	·043 835 616	58	·158 904 109–
17	·046 575 342	59	·161 643 835–
18	·049 315 068	60	·164 383 561–
19	·052 054 794	61	·167 123 287–
20	·054 794 520–	62	·169 863 013–
21	·057 534 246–	**63**	·172 602 739–
22	·060 273 972–	64	·175 342 465–
23	·063 013 698–	65	·178 082 191–
24	·065 753 424–	66	·180 821 917–
25	·068 493 150–	67	·183 561 643–
26	·071 232 876–	68	·186 301 369–
27	·073 972 602–	69	·189 041 095–
28	·076 712 328–	**70**	·191 780 821–
29	·079 452 054–	71	·194 520 547–
30	·082 191 780–	72	·197 260 274
31	·084 931 506–		…………………
32	·087 671 232–	73	**·2**
33	·090 410 958–		…………………
34	·093 150 684–	**146**	**·4**
35	·095 890 410–		…………………
		219	**·6**
36	·098 630 136–		…………………
37	·101 369 863	292	**·8**
38	·104 109 589		…………………
39	·106 849 315	365	**1·**
40	·109 589 041		…………………
41	·112 328 767		365 = 73 × 5
42	·115 068 493	∴	73 Days = ⅕th 219 Days = ⅗ths 146 „ = ⅖ths 292 „ = ⅘ths

EXAMPLES ILLUSTRATIVE OF ACCOUNT-KEEPING,

IN

THE SUGGESTED IMPERIAL SYSTEM,

THE INTEGRAL UNIT BEING

ONE POUND IMPERIAL—VALUE FORTY SHILLINGS.

Comparative Examples in Addition.

Sterling Amounts taken from "Colenso's Arithmetic," Ed. 1865, Page 14, Rule 4, Ex. 1, 2, & 1*a*. Ex. 2, 12.

	STERLING.						IMPERIAL.							
	£	s.	d.	£	s.	d.	£	D.	C.	M.	£	D.	C.	M.
*a*¹)	13	0	8				6	·5	1	6–				
	2	5	6				1	·1	3	7–				
	23	4	7				11	·6	1	4–				
	37	8	10				18	·7	2	1				
	12	9	7				6	·2	3	9–				
	0	13	4	89	2	6		·3	3	3–	44	·5	6	2–
*a*²)	22	4	6¼				11	·1	1	3				
	0	2	6½					·0	6	3–				
	36	0	4¾				18	·0	1	0				
	7	1	1¼	65	8	6¾	3	·5	2	7–	32	·7	1	4
1)	3	13	6				1	·8	3	7–				
	2	11	9				1	·2	9	4				
	3	17	8				1	·9	4	1–				
	2	5	2	12	8	1	1	·1	2	9	6	·2	0	2
2)	14	13	7				7	·3	3	9–				
	22	15	9				11	·3	9	4				
	29	11	11				14	·7	9	8				
	82	17	7	149	18	10	41	·4	3	9–	74	·9	7	1
3)	65	4	3½				32	·6	0	7–				
	22	0	2¼				11	·0	0	4–				
	46	15	7¼				23	·3	9	0				
	73	12	6¾	207	12	7¾	36	·8	1	4	103	·8	1	6
4)	23	13	6¼				11	·8	3	8				
	35	17	0½				17	·9	2	6				
	35	7	7¾				17	·6	9	1				
	67	16	8½	162	14	11	33	·9	1	8	81	·3	7	3
5)	41	16	8½				20	·9	1	8				
	21	10	7¼				10	·7	6	5				
	31	17	7¾				15	·9	4	1				
	24	16	8½	120	1	8	12	·4	1	8	60	·0	4	2
6)	36	17	6¾				18	·4	3	9				
	14	17	6				7	·4	3	7–				
	21	12	7¾				10	·8	1	6				
	13	13	3½	87	1	0	6	·8	3	2–	43	·5	2	5
				£894	8	2½					£447	·2	0	5–

	STERLING.						IMPERIAL.							
	£	s.	d.	£	s.	d.	£	D.	C.	M.	£	D.	C.	M.
7)	24	16	8½				12	·4	1	8				
	51	14	2¾				25	·8	5	5–				
	11	0	8				5	·5	1	6–				
	27	1	3	114	12	10¼	13	·5	3	1	57	·3	2	1
8)	71	17	2½				35	·9	3	0				
	41	2	9¼				20	·5	6	9–				
	54	7	6¾				27	·1	8	9				
	2	11	6	169	19	0½	1	·2	8	7–	84	·9	7	6
9)	16	5	4				8	·1	3	3–				
	35	7	9¼ *				17	·6	9	4– *				
	16	10	8				8	·2	6	6–				
	42	13	8½	110	17	5¾	21	·3	4	3	55	·4	3	7–
10)	11	13	3¾				5	·8	3	3				
	32	12	2½				16	·3	0	5				
	13	13	3¾				6	·8	3	3				
	24	3	0	82	1	10	12	·0	7	5	41	·0	4	6
11)	42	13	4				21	·3	3	3–				
	17	6	8¾ *				8	·6	6	8– *				
	90	9	8				45	·2	4	1–				
	21	12	4½	172	2	1¼	10	·8	0	9–	86	·0	5	3
12)	76	15	4¾				38	·3	8	5				
	32	4	10				16	·1	2	1				
	21	3	7½				10	·5	9	0–				
	62	18	4¼	193	2	2½	31	·4	5	9	96	·5	5	5–
				£842	15	6¼					£421	·3	8	9

Summary of the two respective columns.

£894	8	2½	£447	·2	0	5–
842	15	6¼	421	·3	8	9
£1737	3	8¾	£868	·5	9	4–
						2
			£1737	·1	8	9

Here is an excess shown of one halfpenny and $\frac{11}{100}$ = very nearly 2½ farthings. This, in practice, would be compensated for by the omission of the line in the two amounts marked with an *

20
s. 3,78
12
d. 9· 36
d. 8¾ = 8· 75
Excess, . 61

	+	−		+	−		+	−		+	−		+	−		+	−
No. *a*¹, Exact	—	—	No. *a*², .		·03	No. 1, .		·04	No. 6, Exact	—	—	No. 8, .		·02	No. 10, .	·08	
No. 2.			No. 3.			No. 4.			No. 5.			No. 7.			No. 9.		
£74·971			103·816			81·373			60·042			57·321			55·437–		
× 2			2			2			2			2			2		
£149·942			207·632			162·746			120·084			114·642			110·875		
20			20			20			20			20			20		
s. 18,84			s. 12,64			s. 14,92			s. 1,68			s. 12,84			s. 17,5		
12			12			12			12			12			12		
d. 10,08	·08		d. 7,68			d. 11,04			d. 8,16			d. 10,08			d. 6,		
			¾ = ·75			Excess, .	·04		Excess, .	·16		¼ = ·25			5¾ = 5·75		
Sum of +90									No. 11, .	·19							
Sum of −29			Short, ·07		·07				No. 12, .	·14		Short, ·17		·17	·25		
d. 61															Excess, .	·25	
+	·08		−		·10				+	·49		−		·19	+	·33	

Comparative Examples in Subtraction.

Sterling Amounts taken from "Colenso's Arithmetic," Ed. 1865, Ex. 4, P. 18.

Sterling.				**Imperial.**			
£	s.	d.		ℒ	D.	C.	M.
23	10	8	(1)	11	·7	6	6–
13	7	5		6	·6	8	5–
10	3	2		5	·0	8	1
45	14	7½	(2)	22	·8	6	5–
12	7	5¼		6	·1	8	6
33	7	2¼		16	·6	7	9–
74	0	6¾	(3)	37	·0	1	4
13	8	4½		6	·7	0	9–
60	12	2¼		30	·3	0	4–
89	15	7	(4)	44	·8	8	9–
74	11	9		37	·2	9	4
15	3	10		7	·5	9	5–

Sterling.				**Imperial.**			
£	s.	d.		ℒ	D.	C.	M.
93	0	9	(5)	46	·5	1	9
37	10	11		18	·7	7	3
55	9	10		27	·7	4	6
24	0	5	(6)	12	·0	1	0–
15	12	11		7	·8	2	3
8	7	6		4	·1	8	7–
132	11	6¼	(7)	66	·2	8	8
129	13	4½		64	·8	3	4–
2	18	1¾		1	·4	5	3–
225	0	0	(8)	112	·5		
37	18	9¾		18	·9	7	0–
187	1	2¼		93	·5	2	9–

Sterling.				**Imperial.**			
£	s.	d.		ℒ	D.	C.	M.
137	13	0½	(9)	68	·8	2	5–
111	15	9¾		55	·8	9	5
25	17	2¾		12	·9	3	0–
234	0	11¼	(10)	117	·0	2	3–
195	18	10¾		97	·9	7	2–
38	2	0½		19	·0	5	1
317	14	0½	(11)	158	·8	5	1
239	18	10¾		119	·9	7	2–
77	15	1¾		38	·8	7	8–
345	0	0	(12)	172	·5		
129	17	8¾		64	·9	4	3–
215	2	3¼		107	·5	5	6–

Comparative Examples in Multiplication.

REQUIRED THE AMOUNT OF 38,153 RATIONS AT ½*d.*

Sterling Method.

2)38153

12)19076½ pence.

20)1589 shillings + 8 pence.

£79 pounds + 9 shillings.

Ans. £79, 9*s.* 8½*d.* (*x*)

Note (*a*) As the 1 in the Dec. Eq. stands in the place of the Thousandths, by cutting off Two Figures by the Decimal Point, the given amount is at once divided by One thousand.

(*b*) Because ⅔ds. are the Sixth part of $4=\frac{12}{3}$.

Imperial Method.

Dec. Eq.	·00(*a*)1041⅔
Table I.(*a*)	
1	38·153
04(*b*)	1·52612
1	·038153
b∠÷60	·02543533̇∾
	ℒ39·7427083̇∾
∠×2	ℒ79·4854166∾
∠×20	= 9.70833∾
∠×12	= 8,5

£79, 9*s.* 8½*d.*

Note.—This Example, worked out at length, is given to show that the product of an Infinite Decimal fraction may be perfectly exact.

If the Imperial System was in practice, such rations would be either calculated by Mils, or by $1\frac{4}{100}$th Mils.

In the first case, the amount is at once arrived at = ℒ38·153–

In the second case, the computation would be =

ℒ38·153
∠×$\frac{4}{100}$ 1·526
ℒ39·679 (*c*)

Note (*c*) By converting this amount into Sterling, thus—

	ℒ39·679
∠×2	= ℒ79·358
∠×20	= s. 7,16
∠×12	= d. 1,92

and subtracting it from the product at (*x*)

the rate of ½*d.*	= £79	9	8·5
Product at $1\frac{4}{100}$ mils	= 79	7	1·92
	s.	1	6·58

The difference is seen to be but $18\frac{58}{100}$*d.*

Stg.—Colenso, (P. 19, Rule 6.)

	Sterling.		**Imperial.**
Ex. 1.	£23 13 5		ℒ11·83541⅔
	4		4
	£94 13 8	=	ℒ47·3416∾
Ex. 2.	£37 13 8½	10 =	ℒ188·4270833̇∾
	11	1 =	18·8427083̇∾
	£414 10 9½	=	ℒ207·2697916∾

Conversion of the Two Imperial Amounts to Sterling.

	ℒ47·3416∾		ℒ207·2697916∾
∠×2	94·6833∾		414·539583∾
∠×20	= s. 13,66∾		s. 10,7916∾
	12		12
	d. 8·00	= 9½d.	9·500

Stg.—Colenso, (P. 20, Rule 7.)

	Sterling.		**Imperial.**
Ex. 1.	£23 11 4¾	Dec. Eq.	ℒ117·8489583̇∾
	6	×10	3
	£141 8 4½	30 =	ℒ353·546875
	6	6 ∠÷5	70·709375
	£848 10 3		ℒ424·25625
Ex. 2.	£17 3 0½	Dec. Eq.	ℒ857·60416̇∾
	4	×100 ∠$\frac{4}{10}$	343·04166∾
	£68 12 2		ℒ1200·64583∾
	5		
	£343 0 10		
	7		
	£2401 5 10		

Conversion of the last amt. to Sterling.

	ℒ1200·64583̇
∠×2	ℒ2401·2916∾
∠×2 =	s. 5,833̇∾
∠×12	d. 10,00

Comparative Examples in Multiplication—continued.

Multiply 179 by 3*s.* 11¾*d.* (D.E. = ·099479166∼)

Sterling.

179
3
537
6 — 89 6
3 — 44 9
1 — 14 11
1 — 14 11
½ — 7 5½
¼ — 3 8¾
20)712 3¼
£35 12 3¼

Imperial D.E. 47¾ × 100.

100 — 9·94791666
70 — 6·96354166
9 — ·8953125
£17·80677083
2
£35,6135416
20
s. 12,27083
12
d. 3,25
£35 12 3¼ (£17·807)

The same by shorter methods.

Sterling.

179
(a)∠÷5 £35 16 0
4) s. 179
(a) d. 44¾ = 0 3 8¾
£35 12 3¼

(a) Computed for 4s., and the amount (b) of 179 farthings, deducted, because 4 0
less 0 0¼
= 3 11¾

Imperial.

100 = 9·948
70 = 6·963–
9 = ·895–
£17·807

Conversion of the above to £
£17·807
2
£35·614
2
12·28
12
3·36
¼ = 25
Difference + $\frac{11}{100}$d. 11

Colenso, p. 20, Ex. $\frac{6}{1}$ £23 17 5½ × 15 = 3 × 5.

£ *s.* *d.*
23 17 5½
3
71 12 4½
5
358 1 10½

Imperial.

Imp. Eq. × 10 = 119·364583̇∼
5 = 59·682296̇∼
£179·046879∼
Say, £179·047

Conversion to £

£179·047
£358·094
s. 1·88
d. 10·56
½ ·50
Difference + $\frac{6}{100}$ ·06

Colenso, p. 20, Ex. $\frac{6}{2}$ £79 14 10¼ × 18 = 3 × 6.

£ *s.* *d.*
79 14 10¼
3
239 4 6¾
6
1435 7 4½

Imperial.

Imp. Eq. × 10 = 398·7135416̇
8 = 318·9708333
£717·684375
Say, £717·684–

Conversion to £

£717·684–
£1435·369
s. 7·38
d. 4·56
½ = ·50
Difference + $\frac{6}{100}$d. ·06

Colenso, p. 20, Ex. $\frac{6}{3}$ £93 8 3½ × 21 = 7 × 3.

£ *s.* *d.*
93 8 3½
7
653 18 0½
3
1961 14 1½

Imperial.

Imp. Eq. 1 = 46·7072916̇
∠× 20 = 934·1458333̇
£980·853125
Say, £980·853

Conversion to £

£980·853
£1961·706
s. 14·12
d. 1.44
½ = ·50
Difference − $\frac{6}{100}$ ·06

Colenso, p. 20, Ex. $\frac{6}{13}$ £22 10 8½ × 128 = 4 × 8 × 4.

£ *s.* *d.*
22 10 8½
4
90 2 10
8
721 2 8
4
2884 10 8

Imperial.

Imp. Eq. × 100 = 1126·77083̇
∠÷5 20 = 225·35416̇
∠× $\frac{4}{10}$ 8 = 90·14166
£1442·266–

Conversion to £

£1442·266–
2
£2884·533∼
20
s. 10·66∼
12
d. 8·00

Colenso, p. 20, Ex. $\frac{6}{16}$ £13 7 4¾ × 275 = 11 × 5 × 5.

£ *s.* *d.*
13 7 4¾
11
147 1 4¼
5
735 6 9¼
5
3676 13 10¼

Imperial.

Imp. Eq. × 100 = 668·489583∼
100 = 668·489583∼
70 = 467·942708
5 = 33·424479
£1838·346354
Say, £1838·346–

Conversion to £

£1838·346–
2
£3676·693
20
s. 13·86
12
d. 10·32
¼ = 25
Difference − $\frac{7}{100}$d. ·07

Colenso, p. 20, Ex. $\frac{6}{4}$.

£49 12 8 × 28
7
£347 8 8
4
£1389 14 8

Imperial.

Imp. Eq. 24·8166∼
∠× 20 — 496·333∼
× 8 — 198·533∼
694·866∼
2
£1389·733∼
20
14·66∼
12
8·00

Colenso, p. 20, Ex. $\frac{6}{12}$.

$£43\ 12\ 5\tfrac{3}{4} \times \overbrace{132}^{}$
11 — 11×12
479 17 3¼
12
£5758 7 3

Imp. Eq. × 100.
100 = 2181·197916̇∼
30 = 654·359375
2 = 43·623958
£2879·18125
Say, £2879·181

Conversion to £

£2879·181
2
£5758·362
20
7·24
12
2·88
3·00
Difference − $\frac{12}{100}$d. ·12

Note.—If the half mil line were annexed, the difference would be + $\frac{12}{100}$d.

Comparative Examples in Division.

Divide £35 12 3¼ between 179 persons.

```
    STERLING.                      IMPERIAL.
 £   s.   d.                       £ D.C.M.
35  12   3¼(179                    17.80677(179
 20        ------                  1611     ----
---        3 11¾                   -----    ·0994
712                                 1696
537                                 1611    Say,  ·099 for payment, and
---                                 ----          ·099– for account.
175                                  857
 12                                  716
----                                 ---
2103d.(11                            141
179
---
313
179
---
134
  4
---
537f.(3
537
---
...
```

As the Decimil Figure is less than 5, it is useless to carry the division beyond ·099 (Ninety-nine Mils), there being no coins for a further distribution.

COLENSO, p. 23, Rule 12.
Divide £3715 18 9 by 470 = 47 × 10.

```
    STERLING.                                        IMPERIAL.
 £     s.  d.                                        £     D.C.M.
3715  18   9 (*47                                   ·185/7·96875(47/0
 329        £79   1   3                              141          -------
 ---        ===========                              ---          £3·9531
  425   10) £7·9  1   3                             | 447
  423          20                                     423         Say, 3·953
  ---          ---                                    ---
    2      s. 18·1                                    249
   20          12                                     235
   --          ---                       £3.953       ---
   58(1    d. 1·5                         7·906        146
   47           4                        18·12         141
   --          --                         1·44         ---
   11      f.  20                      ⅓=  50           58
   12                                      --           47
  ---                                      06           --
  141(3                                                 11
  141
  ---      Ans.
  ...   £7 18 1⅓                Difference—6/100d.
```

COLENSO, p. 23, Ex. $\frac{11}{1}$.
Divide £375 13 5½ by 13.

```
    STERLING.                          IMPERIAL.
  £    s.  d.                          £ D.C.M.
  375  13  5½(13                       187·8364(13
             --------------
  26         £28  17  11½              13        £14·4489
  ---        ============              --
  115                                   57
  104                                   52          For payment,
  ---                                   --          Say,   £14·448–
   11                                    58         And for account,
   20                                    52         Say,   £14·449
   ---                                   --
s. 233(17                                 63
   13                                     52
   ---                                    ---
   103                                    116
    91                                    104
   ---                                    ---
    12                                     124
    12                                     117
   ---                                     ---
d. 149(11                                   ··7
   13            6
   ---          4
    19         --
    13     f. 26(2
    --        26
f.   6        ==
    --
```

COLENSO, p. 22, Rule 11, Ex. 1.
Divide £3762 3 6 by 24 = 4 × 6

```
                £    s.  d.
STERLING,     4)3762  3   6
              ---------------
               6)940 10  10½
              ---------------
               £156  15   1¾
              ===============

                £ D.C.M.
IMPERIAL,     4)1881·0875
              -----------
               6)470·2718
               ----------
                £78·378–
```

COLENSO, p. 22, Rule 11, Ex. 2.
Divide £40818 15 0 by 1200
= 12 × 100

```
                  £     s.  d.
STERLING,   12)40818   15   0
            -----------------
           100)34,01   11   3
                 20
                 --
                 31    s.
                 12
                ----
             d. 3,75
                   4
                ----
             f. 3,00
        Ans. £34   0   3¾
        ==================
```

IMPERIAL.—Dec. Eq. ÷ 100.

```
       £ D.C.M.
     4)204·093 75
     ------------
     3)51·023 4375
     -------------
     £17·007 8125
```

Say, for payment, £17·007–
And for account, £17·008

COLENSO, p. 23, Ex. $\frac{10}{2}$.
Divide £187 14 11 by 14 = 7 × 2

```
                £   s.  d.
STERLING,     7)187  14  11
              -------------
              2)26  16   5
              -------------
              £13    8   2½
              =============

               £ D.C.M.
IMPERIAL,     7)93·872 916
              ------------
              2)13·410 4
              ----------
              £6·705 2
     Say,     £6·705
```

COLENSO, p. 23, Ex. $\frac{10}{4}$ £345 13 4 (40 = 8 × 5 = 10 × 4)

```
    STERLING.                 IMPERIAL.                    For payment,
8)£345  13   4      Dec. Eq. ÷ 10 = 17·2833~                £4·320–
-------------                ∠ ÷ 4   4·3208                For account,
 5)£43   4   2                                               £4·321
   £8   12  10
```

EXCHANGES

BETWEEN IMPERIAL AND FOREIGN CURRENCIES.

EXAMPLE.

£193, 17s. 11¾d. Sterling = ...		£96·949–	Imperial.
The Decimal Point moved by One figure to the Right gives at Par (48d. to the Dollar)	. .	$969·495	Dollars.
The Point One figure to the Right, and the amount multiplied by 2, gives at Par (24d.)	Florins, or Rupees,	1938·99	Florins. Rupees.
The Point Two figures to the Right, and the amount multiplied by 2, gives at Par, (24d. to 10 Piastres) . . .	. .	19389·9	Piastres.
The Point Two figures to the Right, and the amount divided by 2, gives at Par (240d. to 25 Francs) or £1 = £2 . .	. .	4847·475	Francs.

Exchange £193, 17s. 11¾d. into Dollars, at 45d. per Dollar.

USUAL STERLING METHOD.

```
(1)      £193 17 11¾
           20
          ----
     s.  3877
           12
         -----
     d.  46535  45
             4   4
        ------  --
     f. 186143(180
        180      ----
        ---   $1034·127∼
         614
         540
         ---
          743
          720
          ---
           230
           180
           ---
            500
            360
            ----
            1400
            1260
            ----
             140
            ====
```

```
       9375
   ∠×8=75
   and  969·49479
   × by         8
       ----------
   =   7755·95833
```

```
   ∴ £7755·9583(·75
         255        ---------
         ---   $1034·127∼
          309
           95                 (4)
           208
            583
             58∼
```

IMPERIAL METHOD.

1*st*. The quickest method in this case is by the use of the Percentage Table.

45d. per Dollar = Percentage of 6·66∼

```
(2)      = 6⅔ Par = $969·4945
         6∠ × 6/100    58·1697
           ⅔∠ ÷ 9       6·4633
                    ----------
                    $1034·1275
                    ==========
```

2*d*. Using the Dec. Eq. of 45d. = ·09375 as a Divisor.

Exact Imp. Eq. at Par, $969·4947916∼

```
(3)   Then 969·49479166(·09375
           9375          ---------
            31994      $1034·127∼
            28125
            -----
             38697
             37500
             -----
              11979
               9375
              -----
               26041
               18750
               -----
                72916
                65625
                -----
                 7291∼
                 =====
```

This Example is worked out at length to show the principle of the Rule, viz. :—

1*st*. For Exchange of Pounds Imperial into *Dollars*, *Divide by Dec. Eq.*

2*d*. For Exchange of Dollars into *Pounds* Imperial, *Multiply by Dec. Eq.*

But very frequently both operations may be shortened.

An Example of the first is annexed.

Exchanges—continued.

Required the Amount in IMPERIAL and STERLING Money of the following :—

(5)		
124 Danish Half Ryksdalers, at the Rate of Exchange of		27$\frac{11}{100}$d.
136 Hungarian Rix-Dollars,	Do.	50$\frac{39}{100}$d.
248 Bremen Pieces of 48 Grotes,	Do.	27$\frac{64}{100}$d.
256 Frankfort Convention Dollars,	Do.	19$\frac{7}{8}$d.

	·11d.		·39d.		·64d.		
Farthings, . .	·00	Farthings, 1 =	·25	f. 2 =	·50	$\frac{7}{8}$d. =	·875
						$\frac{3}{4}$d. =	·75
Difference, .	11	Difference, .	14	Difference, .	14	Difference,	·125

ONE-HUNDREDTH PART OF A PENNY, = ·0002083̇~

Imp. Eq. of 27d. = ·05625
∷2083̇~ × 11 = ·. . . 22916̇~
Imp. Eq. of 27d. 11 = ·05647916̇~

Imp. Eq. of 50$\frac{1}{4}$d. = ·1046875
∷2083~ × 14 ·. . . 29166̇~
Imp. Eq. of 50d. 39 = ·10497916

Imp. Eq. of 27$\frac{1}{3}$d. = ·0572916̇
∷2083̇~ × 14 = ·. . . 2916
Imp. Eq. of 27d. 64 = ·0575833̇~

Imp. Eq. of 19$\frac{3}{4}$d. = ·0411458333̇~
∷2083̇~ × 125 = ÷ 8 = ·. . . 260416̇~
Imp. Eq. of 19d. $\frac{7}{8}$ = ·04140625

200 = ∠ × 2 = 8·28125
50 = ∠ ÷ 4 = 2·0703125
6 = = ·2484375
256 10·6

100 = 5·647916~
20 = 1·129583~
4 = ·225916~
124 7·003416~

100 = 10·497916̇
30 = 3·149375
6 = ·629875
136 14·277166̇

Imp. Eq. . . ·057583̇
∠ × 200 = 11·5166̇~
∠ ÷ 5 40 = 2·3033̇~
∠ ÷ 5 8 = ·4606~
248 14·2806~

Say, £46·161

TOTAL.

DANISH Half Ryksdalers, 124	=	7·003416̇~
HUNGARIAN Rix-Dollars, 136	=	14·277166̇~
BREMEN Pieces of 48 Grotes, 248	=	14·280666̇~
FRANKFORT Convention Dollars, 256	=	10·6
		£46·1612549̇~
		2
The whole STERLING value of the Pieces exchanged is £92, 6s. 5$\frac{4}{10}$d.		£92·3225
		20
	s.	6·45
		12
	d.	5·4

This Example is given to show how, when required, the $\frac{1}{100}$ths of a penny are easily obtained from the Table, and computations made on the Rates given, for entry into Books kept on the IMPERIAL System.

---

(6) Exchange £301, 3s. 9$\frac{1}{2}$d. into Dollars, @ 46d. per Dollar ; £301, 3s. 9$\frac{1}{2}$d. = £150·5947916̇~, and 46d. = ·09583̇~

PAR.
$1505·947916̇
3
4517·84375
2875
16428
14375
20534
20125
4093
2875
12187
11500
6875
5750
11250
Divisor × 3 8625
2625
Divisor × 9 25875
39 called 40 · 375

DEC. EQ.
·09583̇
3
(·2875
$1571·424

REVERSE OPERATION.
Exchange $1571·424 into Pounds Imperial, @ 46d. PAR.
(7)

D.E.	£157·1424
·09	141·42816
∴ 5	7·85712
∷ 8	1·25713
3~ = $\frac{1}{3}$	·05238
Say, £150·595	£150·59479

Exchange of Dollars into Pounds Imperial, by use of Percentage Table.

(10)

PERCENTAGE,		PAR.
@ 46d. = 4·1$\frac{3}{8}$.		£157·14239
4·	6·2856956	
·1	·1571424	
:$\frac{1}{3}$	·0523808	
Repeat	·0523808	
∠	—	6·54759
		£150·5948

Say, £150·595

Exchange of Pounds Imperial into Dollars, by use of Percentage Table.

Percentage of 46d. 4·347826.

(8)

PERCENTAGE.	PAR.
	$1505.947916
4	60·237916
·3	4·517843
:4	·602379
∴7	·105416
∷8	·012047
⁘2	·000301
⁙6	·00009
	$1571·4239

(9)

	PERCENTAGE.
1	43·4782
5	21·7391
05	·2173
9	·0391
4	·0017
7	·0003
	1505·9479
	$1571·4236̇

Exchanges—Continued.

A person wishes to remit to England £193, 17s. 11¾d. by a Government Bill @ Two per cent. premium, which has to be deducted from the remittance. What amount must the Bill be drawn for ?

RULE.—*At a Premium*—Divide the amount by 100, *plus* the premium.

(11)
£ s. d.
193 17 11¾ = £ D.C.M. 96·9495 (102
£95·0485
∠× 2=190·097
∠÷20 ·194
∠×12 d. 1·968
Ans. £190, 0s. 2d.

100
+ 2
£ D.C.M.
96·9495 (102
. 514
. . 495 £95·0485
.870
540
30
Proof.
£95·0485
2 per cent.=(*a*)(*b*) 1·90097
(*a*)+(*b*) 96·9495

If the Bill were at Two per cent discount, what should it be drawn for ?

RULE.—*At a Discount*—Divide the amount by 100, *minus* the discount.

(12)
96·9495 (98=100—2)
8·74
·909 98·9280
275 £197·856
790
. . 60 s. 17·12
d. 1·44
Ans. £197, 17s. 1½d.

Proof.
98·9280
2 per cent.=(*b*) 1·9786
a—*b*=96·9495

EXCHANGES BETWEEN POUNDS IMPERIAL AND DOLLARS.

Amount operated with, £1301, 13s. 11¾d.=to Pounds Imperial, £650·849–

Pounds Imperial to Dollars.
@ 45d.=per cent. 6·66∼=⅔÷10

(13)
£650·8495
Par = $6508·495
⅓÷10= 216·94983∼
⅓÷10= 216·94983∼
$6942·3946∼

Dollars to Pounds Imperial.
@ 45d. per cent. 6·25=⅝÷10.

(14)
$6942·394
Par = £694·2394
$\frac{4}{8}$=34·71197
⅛= 8·67798
∠ 43·3899
£650·8495

@ 46*d.*=per cent.
∠=4·347826

(15)
6000= 260·86956
500= 21·73913
8= ·34782
. 4 ·01739
. . 9 ·00391
Par $6508·495
$6791·472

@ 46*d.*=per cent. 4·166̇∼
∠4·1⅔ 6791·472

(16)
Par £679·1472
4· =27·1658
·1= ·67914
·⅓= ·22638
·⅓= ·22638
∠ 2 28·2977
£650·8495

(17) @ 50d.=per cent. 4.
£650·8495
Par $6508·495
Sub. 4 p. ct.= 260·3398
$6248·1552

@ 50d.=4·166̇∼=4·1⅔.

(18)
$6248·155
Par £624·81552
4· 24·99262
·1 ·62481
·⅓ ·20827
·⅓ ·20827
£650·8495

@ 51d. per cent.=5·882352.
Par . . . . $6508·495

(19)
58·82352
6000· 352·94112
500· 29·41176
8· ·47058
·4 ·02352
. . 9 ·00529
∠ 382·852
$6125·643

@ 51d.=6·25=6·¼.
Par.

(20)
$6125·643
£612·5643
∠×$\frac{6}{100}$=36·75385
¼= 1·53141
£650·8495

Pounds Imperial into Francs.

@ 50f. 80c. per £.

Amount the same as for Dollars.

(21)
£650·8495
Par 32542·475
×$\frac{8}{10}$ 520·6796
Fcs. 33063·15∼46

Francs into Pounds Imperial.

(22)
Fcs. Cmes. F. C.
33063·1546(50·8
. 2583
. . 4315 £650·8495
.2514
4826
2540

Pounds Imperial into Roubles.

@ 6 Roubles 40 Copecs per £=12·80 per £ Imperial.

Same amount as for Francs.

(23)
£650·8495
10.=6508·495
2.=1301·699
∠×$\frac{4}{10}$ .8=520·6796
Roubles, 8330·873

Roubles into Pounds Imperial.

(24)
Rs. 8330·8736 (12·8
. 650
. 1087 £650·8495
. . 633
1216
. . 640
. . .

Exchanges—continued,

Pounds Imperial into Rupees.

In £650·849—How many Rupees at Par?

Point by One figure to the Right, . 6508·495
× 2

(25)

Rupees, 13016·99

In £1301, 13s. 11¾d.—How many Rupees at 1s. 11¼d. per Rupee?

Equivalent Imperial, amount by One figure to the Right, = 6508·495

10000·	×	(1s. 11¼d.) D.E.	=	4843·75
2500·		∠÷ 4	=	1210·9375
833·333	(26)	∠÷ 3	=	403·6458⅓
83·333		∠÷ 10	=	40·3645
16·666		∠÷ 5	=	8·0729
3·333		∠÷ 5	=	1·6145
·166		∠÷ 20	=	·0807
·041		∠÷ 4	=	·0201
·020		∠÷ 2	=	·0100
Rs. 13436·89		=		£6508·49

This Example is given to show the BALANCE FACTOR Method, which is at times conveniently used to avoid a long and tedious division.

The usual method would be as follows:—

IMPERIAL AMOUNT.	IMP. EQ. OF 1s. 11¼.
×10 = 6508·495	·0484⅜
× 8	× 8
52067·960	(·3875
13317	Rs. 13436·89
16929	
14296	
26710	
34600	
36000	
1125	

Rupees into Pounds Imperial.

In Rupees 13436·89, @ 1s. 11¼d. per Rupee—How many Pounds Imperial and Sterling?

Dec. Eq. ·0484⅜ Rs. ÷ 100 = 134·3689

(27)

× 4 ∠ = 537·4756
× .8 = 107·49512
× ..4 = 5·37475
¼ = ·33592
⅛ = ·16796

Ans. £650·8493
2

£1301·698–
s. 13·97
d. 11·64
¾ = 75

Short, ·11

Ans. £1301, 13s. $11\frac{64}{100}$d.

Pounds Imperial into Guilders.

In £1301, 13s. 11¾d.—How many Guilders are there, @ 20d. per Guilder?

£1301 13 11¾ = £650·8495
6

(28)

3905·097
4

Ans. Gdrs. 15620·388

Guilders into Pounds Imperial and Sterling.

In Guilders 15620·388—How many Pounds at 20d. per Guilder?

DEC. EQ. Gs. PAR ÷ 100.
·041⅔ 156·20388

(29)

∠×4 = 624.81552
1 = 15·62038
⅓ = 5·20679
⅓ = 5·20679

£650·84948 (·849)

£1301·69896
20

s. 13,9792
12

d. 11,7504

Milrees into Pounds Imperial and Sterling.

Convert 4750 Milrees 280 Rees into English Money, @ 64¼d. per Milree.

B. Smith, p. 265, Ex. LXVII.–2.

Dec. Eq. 64¼d. × 1000 = 133·85416

(30)

∠× 4 = 535·41666
× 7 = 93·69791
× 5 = 6·69271
× 02 = ·026770
× 8 = ·010708

£635·8448
£1271·6897
s. 13,794
d. 9,32

Usual method, and in this instance the shortest:—

4750·28 @ 5s. 4¼d.
(31) 5

23751·40
4d. = ⅓ = 1582·426 79
∠÷4 = 395·856 ÷ 4 = 98·964 12

20)25433·79 d. 9,48

£1271 13 9½

= £635·844–

In 2000 Milrees, @ 68d.—How many Pounds Imperial and Sterling?

Dec. Eq. of 68 × 1000 141·666~
(32)
∠×2 £283·333~

£566, 13s. 8d. £566·666~

Miscellaneous Examples.

(1) COMPARATIVE EXAMPLE IN AN INVOICE OR BILL OF PARCELS.

No. of Parcel.	Quantities.	Sterling Rates.	Sterling Amount. £	s.	*d.*		Imperial Rates.	Imperial Amount. ℒ	D.	C.	M.
1	52976	@ ¾d.	165	11	0	=	m. 15⅝	82	·7	7	5
2	52976	„ 1½d.	331	2	0	=	m. 3⅛	165	·5	5	
3	976	„ 3d.	12	4	0	=	c. ⅝	6	·1		
4	8128	„ 4½d.	152	8	0	=	m. 9⅜	76	·2		
5	861	„ 1/4d.	57	8	0	=	c. ⅓	28	·7		
6	1672	„ 3/3d.	271	14	0	=	c. 8⅛	135	·8	5	
7	1728	„ 1/3d.	108	0	0	=	c. 3⅛	54	·		
8	1288	„ 19½d.	104	13	0	=	m. 40⅝	52	·3	2	5
9	861	„ 5/4d.	229	12	0	=	d. 1⅓	114	·8		
10	72	„ 6/8d.	24	0	0	=	d. 1⅔	12	·		
11	32	„ 88/6d.	141	12	0	=	ℒ2/·2⅛	70	·8		
12	64	„ 44/6d.	142	8	0	=	ℒ1/·1⅛	71	·2		
			1740	12	0	=		870	·3		

(2) COMPARATIVE EXAMPLES OF COMPUTATION, IN EACH METHOD, OF THE PARCELS COMPOSING ANNEXED INVOICE.

£		
@ ¾d.	(1)	
52976		ℒ
½ 26488		m. @ 15⅝m.
¼ 13244		10 52·976
		5 26·488
12)39732d.		4/8 2·6488
20)3311		⅛ ·6622
£165, 11s.	=	ℒ82·775

£		ℒ
@ 1½d.	(2)	@ 3⅛m.
1 52976		52·976
½ 26488		3⅛m.
12)79464		158·928
20)6622		⅛= 6·622
£331, 2s.	=	ℒ165·55

£		ℒ
@ 3d.	(3)	@ ⅝c.
976		9·76
∠÷ 4= 244		4/8= 4·88
		⅛= 1·22
∠÷20 £12, 4s.	=	ℒ6·1

£		ℒ
@ 4½d.	(4)	@ 9⅜m.
8.128		8·128
		9⅜
4=∠⅓ 2709 4d.		73·152
½=∠⅛ 338 8d.		2/8 2·032
20)3048s.		⅛ 1·016
£152, 8s.	=	ℒ76·2

£		ℒ
@ 1/4d.	(5)	@ ⅓c.
1s. = 861		86·7
4d.=∠⅓= 287		∠÷3 =
20)1148		
£57, 8s.	=	ℒ28·7

£		ℒ
@ 3/3d.	(6)	@ 8⅛c.
1672		1672
3		8⅛
5016		
∠÷4 418		133,76
20)5434		⅛= 209
£271, 14s.	=	ℒ135,85

£		ℒ
@ 1/3d.	(7)	@ 3⅛c.
1/=1728		1728
∠÷4= 432		3⅛
20)2160		5184
		∠÷8 216
£108·	=	ℒ54·

£		ℒ
@ 1/7½d.	(8)	@ 40⅝m.
1/ =1288		1288
6d. = 644		40⅝
1 = 107.4		51520
½ 53.8		4/8 644
20)2093s.		⅛ 161
£104, 13s.	=	ℒ52·325

£		ℒ
@ 5/4d.	(9)	@ 1⅓d.
861		1=861
4/=⅓ 172, 4s.		∠÷3=287
∠÷3 57, 8		
£229, 12s.	=	ℒ114·8

£		ℒ
@ 6/8d.	(10)	@ 1⅔d.
72		1 =72
—		⅓=24
∠÷3=24		⅓=24
£24	=	ℒ12·

£		ℒ
@ 4/8/6	(11)	@ 2/·2⅛
32		32
4/8/6		2·2⅛
128		64
4/= 6·8		64
4/= 6·8		⅛ 4
∠÷5 16		
£141, 12s.	=	ℒ70·8

£		ℒ
@ 2/4/6	(12)	@ 1/·1⅛
64		64
2/4/6		1·1⅛
128		704
4/= 12·16		⅛= 8
1·12		
£142,8s.	=	ℒ71·2

(3) EXAMPLES OF ACCOUNTS, CARRIED TO DECIMILS, IN SUBSIDIARY BOOKS. WHEN REQUIRED FOR REGISTERING THE MINUTE COSTS OF THE SUBDIVISIONS OF ANY WORK, EITHER AS TO MATERIAL OR LABOUR.

(1)

Quantities	Rates.	ℒ	D.	C.	M.	dms
146	dms. 2		·0	2	9	2
93	„ 16		·1	4	8	8
285	„ *a*75	2	·1	3	7	5
112	„ *b*562	6	·2	9	4	4
54½	„ *c*1245	6	·7	8	5	2–
		15	·3	9	5	1–

(2)

Quantities.	Rates.	ℒ	D.	C.	M.	dms.
2887	dm. 1		·2	8	8	7
1272	„ 1½		·1	9	0	8
682	„ 3		·2	0	4	6
4216	„ 4	1	·6	8	6	4
1713	„ 4½	1	·0	7	0	8–
		3	·4	4	1	3

(3)

Quantities.	Rates.	ℒ	D.	C.	M.	dm.
5685	dm. 2½	1	·4	2	1	2–
841	„ 3½		·2	9	4	3–
1264	„ *d*35	4	·4	2	4	
4812½	„ 2		·9	6	2	5
8568	„ 4¼	3	·6	4	1	4
		10	·7	4	3	5

These three TOTALS would be JOURNALISED as under:—				
(1)	15	·3	9	5
(2)	3	·4	4	1–
(3)	10	·7	4	3–
	ℒ29	·5	8	

a This may be read either 75 Decimils or 7½ Mils.
b This may be read Five Cents Sixty-two Decimils.
c This may be read Twelve Cents Forty-five Decimils.

d·This may be read either Thirty-five Decimils, or Three Mils and a half.

Miscellaneous Examples.

Percentages, Interests, Premiums, Discounts, Commissions, Brokerage, &c.

(4) Amount operated with, £193, 17s. 11$\frac{3}{4}$d. = £96·9495.

10, 1, and $\frac{1}{10}$ per cent.
10 per cent. 9·69495
1 „ ·969495
$\frac{1}{10}$ „ ·0969495

9 per cent.
96·9495
9·69495
£8·725455

8 per cent.
96·9495
19·3899
£7·75596

7 per cent.
96·9495
∠ × $\frac{7}{100}$ = 6·786465

6 per cent.
96·9495
∠ × $\frac{6}{100}$ = 5·81697

5, 2$\frac{1}{2}$, and 1$\frac{1}{4}$ per cent.
96·9495
5 per cent. ∠ ÷ 2 = 4·847475
2$\frac{1}{2}$ „ ∠ ÷ 4 = 2·4237275
1$\frac{1}{4}$ „ ∠ ÷ 8 = 1·21186375

$\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ per cent.
96·9495
$\frac{1}{2}$ per cent. = ·4847475
$\frac{1}{4}$ „ = ·24237275
$\frac{1}{8}$ „ = ·121186375

3$\frac{1}{2}$ per cent. Premium.
96·9495
∠ × $\frac{3}{100}$ = 2·908485
∠ ÷ 6 = ·4847475
£100·3427325

3$\frac{1}{2}$ per cent. Discount.
96·9495
3·3932325
£93·5562675

---

(5) Required the Amount of £225 in 4 years, at 3$\frac{1}{2}$ per cent, *simple interest.*
(Barnard Smith, Ed. 1862, p. 231.)

£225 = £112·5 . Interest 3$\frac{1}{2}$ × years 4 = 14
∠ ÷ 10 = 11·25
∠ × 4/10 = 4·5
14 £128·25
£256·5 = *Ans.* £256, 10s. 0d.

(8) Required the Amount of £625, at the end of 3 years, at 4$\frac{1}{2}$ per cent., *compound interest.*
(Barnard Smith, Ed. 1862, p. 234.)

£625 = £312·5 Log. 2·4948500
Interest on 1 for 1 year, 1.045, Log. ·0191163
Interest on 1 for 2 years, ∠ × 2 ·0382326
Log. 2·5521989

Nat. No. £356·6144
£ 713,2288
s. 4,576
d. 6,912

Ans. £713, 4s. 6$\frac{91}{100}$d.

(6) Required the *compound interest*, and the amount of £720, for 3 years, at 5 per cent.
(Barnard Smith, Ed. 1862, p. 233.)

£720 = £360·
5 per cent. = 18·
1st year, = £378·
5 per cent. = 18·9
2d year, = £396·9
5 per cent. = 19·845
3d year, = £416·745
Less original amount, 360·
Interest, . £56·745

Nat. No. £416·745
£833·49
s. 9,8
d. 9,6

(7)

The annexed method may do for three or four years, but would be very inconvenient for a much longer term. The proper way is to work by logarithms, of which the following is an example:—

Log. 360· = 2·5563025
Log. 1·05 = (*a*) ·0211893
∠ × 2 = (*b*) ·0423786
Log. 2·6198704

Answer.

	£	s.	d.
Orig. amt., with interest,	£833	9	9$\frac{3}{5}$
Less original amount, .	720	0	0
Three years' compound interest,	£113	9	9$\frac{3}{5}$

NOTE.—(*a*) is the log. of 1·05 *interest* for *one* year on 1, at 5 per cent.; and (*b*) is twice that log., being that of the *interest* for 2 years, and 1 + 2 = 3 years, the *total term.*

(9) In Ten Millions of Farthings, how many Pounds *Imperial* and Pounds *Sterling* are there?

The Decimal Point in this case must be placed after the *fourth* figure from the lowest of the three initial zeros (the *Mil* zero), and the amount in *Imperial money* can be at once taken out from Table.

10,000,000 Farthings = £5208·33$\dot{3}$∼
2
£10416·66$\dot{6}$
s. 13,33
d. 4,00

Ans. £5208·33$\dot{3}$–
£10416 13 4

Proof by usual Sterling Method.

10,000,000 Farthings.
∠ ÷ 4 = 2,500,000 Pence.
∠ ÷ 12 = 208,33$\dot{3}$∼ Shillings + 4d.
∠ ÷ 20 = 104·16 Pounds + 13s.
£10,416 13 4

(10) In Ten Millions of Dollars, at 44$\frac{3}{4}$ pence exchange per Dollar, how many Pounds *Imperial* and Pounds *Sterling* are there?

From Table—Imp. Eq. of 44$\frac{3}{4}$d. = ·0932291$\dot{6}$∼

Here the Decimal Point has its place after the *sixth* figure from initial zero. Therefore the amount Imperial is,

£932291·666–
£1864583·33$\dot{3}$∼
20
s. 6,66∼
12
d. 8,00

Ans. £1864583, 6s. 8d.

In Ten Millions of Dollars, at 45d., how many Pounds Imperial and Pounds Sterling are there?

From Table—Imp. Eq. of 45d. = ·09375.

This equivalent, divided by Ten Millions, is ·0000009375. Six *integral* figures are therefore required, and *two* zeros must be added to the amount. Therefore—

The amount Imperial, . . = £937500 . . .
And the amount Sterling, . = £1·875000

For tyros in Decimal Arithmetic, the formula for the mental operation to find the place of the *decimal point,* in cases like these, is as follows:—From the sum of number of figures in Decimal Fraction, and number of figures, less 1, in the *multiplier*, if commencing by 1, subtract the number of *initial* zeros, and number of figures in Decimal Fraction.